Chapter 3
The Social Divide

For many the phrase ‘digital divide’ has become a familiar catch phrase signifying the gap between information haves and have-nots, including splits along racial, gender and class lines. The U.S. Department of Commerce has drawn attention to these disparities in successive studies since 1993. Falling through the Net emphasizes the lack of access to computers and the Internet commonly found in America among poorer households, those with only high-school education, the black and Hispanic populations, rural communities and women¹. Pew surveys in Spring 2000 confirm the familiar pattern found in many U.S. studies, with sharp inequalities of Internet access by age, education, race and ethnicity, plus the more modest gender gap (see Figure 3.1). Three-quarters of all American college graduates use the Internet compared with less than a fifth of those who failed to graduate from high school. One half of all whites are online compared with one third of all blacks. And two-thirds of the younger generation are online compared with one in ten among the over 65s. The OECD has documented similar patterns of stratification among the Internet population in Canada, Australia and Finland².

[Figure 3.1 about here]

The concern about the digital divide is that groups lacking access may become further marginalized in societies where basic computer skills are becoming essential for economic success and personal advancement, admittance to good employment and educational opportunities, full access to social and communication networks, and opportunities for civic engagement. Recognizing the potential problems of a two-track knowledge economy, the EU has prioritized the need for social inclusion as one of its objectives when launching the e-Europe Action Plan. The EU’s strategy involves reducing the costs of Internet access through market liberalization as well as making terminals and onsite training available in public spaces like unemployment offices, libraries and schools³. Concerns about Internet access have driven initiatives taken by the Blair government. The British Department of Trade and Industry has established a network of city learning centers, distributed re-conditioned computers to homes in poor neighborhoods, and developed a national grid linking all public libraries to the Internet⁴. Similar policy initiatives to overcome the digital divide have been launched recently in many other European countries. To evaluate whether these initiatives are likely to work we need to explore the underlying reasons for the digital divide and the likely projection of future trends. This chapter therefore focuses upon three core questions:

?? What theories provide plausible accounts of Internet diffusion?
Who is typically online in postindustrial societies, and, in particular, does the social profile of Internet users found in the United States reflect that found elsewhere?

Do the social inequalities in the online population reflect the particular characteristics of Internet diffusion or does this pattern reflect inequalities found in access to old media like cable television and fax machines?

Theories of Internet Diffusion

Although attracting widespread concern, interpretations of the underlying reason for the digital divide remain under debate, for example the appropriate weight that should be given to race and income in predicting American patterns of access and use. Even greater uncertainty surrounds the projection of future population trends on the Net and two mainstream perspectives have become common. On the one hand, the ‘normalization’ thesis discussed in Chapter 1 suggests that, at least in affluent postindustrial societies, the profile of the online community will gradually broaden over time, like the audience for radio or television, until it comes to mirror society as a whole. In countries at the forefront of the information revolution, use of the Internet has rippled out within the last decade from an information source networking scholars and scientists at elite research institutions to become a medium of mass entertainment for the delivery of video and audio programming, as well as e-commerce and home shopping, used throughout the population. This interpretation suggests that in affluent societies use of the Internet could eventually become as popular as watching TV if penetration levels eventually reach 90-95% of the population, encouraged by falling access costs and the growth of online entertainment. Popular commentators swept up in the giddy hype of new gizmos and gadgets, surrounded at home and work by easy access to all the Net, all the time, often assume that eventually most will succumb to the digital onslaught. Some suggest that competition in the marketplace will eventually take care of any residual major disparities, removing the need for any government intervention or regulation for the provision of universal service, beyond the minimal prevention of monopolistic practices.

Yet an alternative scenario is possible if the diffusion theory developed by Everett Rogers is applied to the future spread of the Internet. Research on the dispersion of many different types of new innovations has produced hundreds of case studies since the 1960s, ranging from the spread of new crops studied by rural sociologists to the implementation of new teaching techniques studied by educational psychologists. These studies have commonly established that, compared with laggards, early adopters of new innovations are characteristically drawn from higher socioeconomic groups. Above average education, literacy and social status provides greater access to information and the resources to adapt more flexibly to innovations. Moreover, diffusion theory suggests that the adoption of successful new technologies often reinforces economic advantages, so that the affluent
become richer, and the less well-off laggards become relatively poorer. Everett Rogers emphasizes that this pattern is far from inevitable, since the conditions under which an innovation is implemented determines, in part, the social consequences. Active initiatives to ‘level the playing field’ by government and non-profits can broaden the diffusion process. The existing social structure also plays a role; innovations in highly stratified societies will usually reinforce existing socioeconomic disparities. Nevertheless without successful intervention, if the spread of the Internet follows the normal trajectory established by previous technologies, then in the early-to-middle stages of the ‘S’ shaped diffusion curve, stratification in computer access and Internet use can be expected to widen social divisions.

The cross-national evidence on this issue remains scattered and inconclusive but some indicators point towards normalization within the U.S. Internet population. After analyzing trends from 1995 to 1998 in Harris national surveys, David Birdsell and colleagues concluded that as the proportion of users surged from 14% to 58% of all Americans, the demographics of the online community broadened: “Once heavily overbalanced by male users, the Web is now accessed by men and women almost equally. And once predominantly white, the Web population now reflects a racial breakdown statistically indistinguishable from Census data for the general population... The Web reflects America much more accurately today than when the technology was in its infancy.”

Along similar lines, the 1998 Pew Research Center study The Internet News Audience Goes Ordinary also reported greater diversification in the American online community: “Increasingly people without college training, those with modest incomes, and women are joining the ranks of Internet users, who not long ago were largely well-educated, affluent men.” Other research has found that the gender gap in the U.S. Internet population has become insignificant in recent years. The Stanford Institute’s study by Nie and Erbring suggests that racial differences in online access in America have become less important today than income differentials, conclusions echoed by the Forrester Report.

Yet other evidence in America points in the contrary direction. The 1999 report, Falling through the Net, emphasized that the digital divide between those with access to new technologies and those without have widened over time in terms of racial, educational and income inequalities, not narrowed. The study concluded that ethnic differences in the virtual world cannot be accounted for solely by affluence since within every income category African-Americans lag substantially behind white Americans in their adoption of home computers and links to the Web: “A White, two-parent household earning less than $35,000 is nearly three times as likely to have Internet access as a comparable Black household and nearly four times as likely to have Internet access as Hispanic households in the same income category.” Anthony Wilhelm found that racial and ethnic differences in computer usage have not disappeared, since they persist even after controlling for
education and household income. A detailed study of trends in computer ownership and Internet use from 1997-98 by Hoffman and Novak also concluded that the overall gap between whites and African Americans has increased over time. Moreover it remains uncertain whether 'normalization' of African-American participation in the U.S. Internet population will eventually occur even if use of the Web eventually reaches 90-95% of all Americans, since race continues to predict use of far more basic and long-established technologies like access to household telephones. To clarify the broader pattern and generalize more widely beyond the U.S. we need evidence about trends in the online population in a wide range of societies at different levels of Internet development.

The most straightforward approach to testing these theories would be to compare time-series data to observe whether the digital divide has widened or narrowed in recent years. Yet benchmark data from the early-to-mid 1990s remains limited, even in the United States. Given the rapid pace of technological changes, which is likely to continue, it remains difficult to project more broadly from the a-typical characteristics of early adopters. The available evidence on the digital divide in the United States may reflect endemic inequalities within this particular society, such as the deep cleavage of racial divisions, or it may reveal general patterns characteristic of those who participate in the online community elsewhere. Even fewer surveys have monitored trends in Internet use across many different countries although more information is rapidly becoming available. For comparative data this chapter draws on the bi-annual series of Eurobarometer surveys conducted since 1970 in the 15 EU member states by the European Commission. For the US we analyze successive surveys conducted on a regular basis since 1995 by the Pew Center on the People and the Press, providing perhaps the most detailed continuous time-series data on Internet use available in America. The survey items are not identical in both series but functionally equivalent items allow comparison of demographic patterns of Internet use from spring 1996 to spring 1999. The main findings were crosschecked against secondary sources for comparison with other nations.

The comparison of the US and Europe includes both leaders and laggard societies. This allows us to test the 'normalization' claim that the size of the digital divide relates to the level of Internet diffusion. European member states provide a range of postindustrial societies that are relatively similar in terms of their levels of socio-economic development, political systems, and cultural traditions. This comparison follows the classic logic of the 'most similar system' design, which assumes that the factors common to relatively homogeneous types of society are irrelevant to explaining their differences. Fairly similar levels of literacy, education and affluence in European nations means that these differences can be largely discounted in searching for explanations of the digital divide. At the same time the countries under comparison vary greatly in terms of the dependent variable, the proportion of Internet users. Overall one fifth of all Europeans are online but some Northern European nations are forging ahead in the digital age while others in the
Mediterranean region lag behind (see Table 3.1, 3.2 and Figure 3.2). In spring 1999, 61% of all Swedes were online, resulting in ten times as many Internet users in Sweden compared with Portugal and Greece. Use of computers confirms parallel contrasts, ranging from three-quarters of the population in Sweden and two-thirds in Denmark and the Netherlands down to less than a fifth in Greece. If the ‘normalization’ predictions are correct then we might expect to find that the relative size of the digital divide by social status, age and gender would diminish most in societies at the forefront of the information society like Sweden and Denmark. The social and demographic characteristics of the online community in different countries can first be described before multivariate analysis is used to examine the relationship among these variables.

[Table 3.1, 3.2 and Figure 3.2 about here]

**Who is Online?**

**Income**

The digital divide is a multidimensional phenomenon tapping many social cleavages but differences of resources are commonly assumed to be among the most important, meaning the capacities based primarily upon income, occupation and education that people bring towards using new forms of info-tech. Falling through the Net emphasized that household income was one of the strongest predictors of Internet access in America. U.S. Census data shows that home ownership of PCs quadrupled from 1984 to 1997, but this period saw growing disparities in ownership among social strata based on household income, race and education. An OECD study, drawing on data from France, Japan and the United States, confirmed the substantial disparity in the availability of personal computers in the home for different levels of household income, with the size of the gap between the lowest and highest income groups widening from 1995 to 1998. Economic resources including personal or household income influence the ability to afford home computers and modems, software, and the monthly ISP and connection charges. The latter can be substantial, especially where local calls are metered, outweighing the initial investment in computer hardware within a few years. The OECD’s Information Technology Outlook study found that the growth in Internet demand has been driven by a combination of faster connection speeds, improved reliability and service, easier use, and declining access costs. Dial-up telephone modems currently remain the most popular mode of household access, used in two-thirds of all homes, although more advanced forms of delivery are becoming more widely available including cable, DSL, ISDN and wireless.

How far does household income affects Internet access? Table 3.3 provides the comparison of trends over time in Internet use within Europe. Figure 3.3 illustrates the size of the gap in Internet access between the most and least affluent quartile household incomes, with the nations ranked by their overall level of Internet penetration. Three major findings stand out. First, as
expected, the income gap across the whole of Europe was substantial; on average the richest European households were three times more likely to be online than the poorest ones. Overall 37% of those living in the most affluent households were online compared with only 14% of those in the poorest homes. There was a consistent and significant association between household income and levels of Internet access across all EU countries except for Greece. Moreover, across Europe the relative size of the gap between rich and poor stayed roughly constant from spring 1996 to spring 1999, rather than increasing or diminishing. During these years the EU Internet population grew at a rate of roughly 10% per annum. Lastly, the comparison of societies that are leader and laggards in the information age gives no support to the proposition that income differentials necessarily diminish as Internet use widens throughout the population, if anything the reverse. Despite relatively widespread use of the Internet in Britain, for example, the most affluent households were five times more likely to access the Internet than the poorest. The variations among European countries suggests that particular factors within each nation may influence access, such as public initiatives to make wired computers widely available through community centers, unemployment offices and schools, as well as market competition driving down the financial costs of hardware, software and access charges, and cultural attitudes towards science and technology. But at least in the emerging years the differential between rich and poor families evident in countries like Britain, Luxembourg and Denmark mean that we would not expect the income divide to close automatically as the Internet diffuses more widely throughout society.

[Figure 3.3 about here]

Occupation

Related patterns in the work force can also be expected to be important for many reasons. Professional and managerial jobs in the service sector facilitate 24/7 Internet connections at the office, often through high-speed LAN networks, as well as providing training assistance and technical support. Companies also commonly provide managers and executives with mobile equipment like laptops, digital assistants and phones, as well as subsidizing home access charges, to facilitate connectivity with the office. Professional, managerial and executive salaries provide the affluence to pay for consumer durables like computers and high-speed cable connections for the home and family, even household intranets facilitating multiple connections. In contrast manual workers, while they may use computers as part of the industrial manufacturing process, are unlikely to have Internet access at work or to acquire the skills and experience at work that breeds comfort and familiarity with the Web. Governments in Britain, Germany and Sweden have often emphasized the need to bring the unemployed into the knowledge economy, through the provision of networked computers in job centers and unemployment offices, nevertheless even with these initiatives those seeking work are
likely to be among the most marginalized and poorest members of society. Occupation may prove less important over time as the Internet diffuses more widely. The surge of Americans going online has come from home access doubled during the last five years, with little increase in the proportion getting access to the Internet via work during the same period.\(^{23}\)

Figure 3.4 shows the distribution of Internet access by the respondent's occupation in the workforce. The pattern confirms that managers and professionals are almost twice as likely to use the Internet as those in other white-collar jobs like clerical assistants and service sector employees, and managers are almost three times as likely to use the Internet as manual workers. Access for the unemployed fell just below the level of manual workers. Again, the gap between the info-rich and poor varied across nations but it proved largest among certain leader societies including the UK, Finland, and Denmark, and slightly more marked than the disparities already observed by household income.

Education

The related divide in Internet use by educational attainment is well established in many studies in the U.S., with groups like students among those most familiar with the Net; for example Wilhelm concluded that education was a stronger determinant of connectivity in America than any other demographic or social variable.\(^{24}\) Many reasons can be given for this pattern. Schools and colleges provide an environment that is exceptionally rich in all forms of info-tech and indeed these have usually been among the first institutions wired to the Net in most countries. Education can be expected to improve the general capacity for analytical reasoning and information filtering, as well as strengthening numeracy, literacy, English-language and keyboard skills. Schools and colleges provide students with free email and web hosting facilities, computer labs, as well as direct hands-on experience of surfing the Internet for research, and training or technical support in using common software packages. College education is also closely related to subsequent occupational status and income, as well as being linked to generational patterns of diffusion, illustrated by the popularity of programs like Napster on college campuses. Figure 3.5 illustrates the relationship between the age of finishing education and use of the Internet in Europe. The results confirm the expected pattern, showing similar results to the inequalities evident in the workforce. In Europe, those with college education are seven times more likely to be online compared with those who left school at 15. Indeed over 40% of college students in Europe were online, a figure ranging up to 80% of all students in Sweden and Finland.
Gender

The gender gap within the online community has been the subject of widespread study. Some surveys have reported that this difference has closed recently in America, for example the Pew Internet and American Life tracking survey suggested that by spring 2000 the surge in the number of women online had produced gender parity in the U.S. Net population, although women and men continued to differ in their Internet attitudes and behavior\textsuperscript{25}. Nevertheless the evidence about the gender gap remains inconclusive, for example AC Nielsen's Net Watch surveyed 13 nations in North America, Europe and Asia in Spring 2000, and found that women were less likely to be online in every country, including the U.S., with almost twice as many male to female Internet users in Germany, Hong Kong, and Taiwan.\textsuperscript{26} Many plausible reasons may account for any gender differences in use of computer technology and within the online community. Bolt and Crawford review a wide range of evidence suggesting that girls and women are less likely to use computers because of their early experiences within school classrooms, reflecting long-standing gender differences in attitudes towards science and technology, as well as the typical contents of computer games and web sites available for children\textsuperscript{27}. The position of women as primary caregivers in the home and family may also play a role, since we have already observed the importance of work environments for Internet access. In Europe, the evidence on male and females within the online community in Figure 3.6 shows that the gender gap is the weakest predictor of Internet use among all the factors we have considered so far, with the difference between women and men becoming statistically insignificant in Belgium, Denmark, France, Portugal, the UK and Finland. Nevertheless a gender gap was evident elsewhere, especially in the Netherlands, Sweden and Italy, despite Swedish traditions as an egalitarian society for sex equality.

[Figure 3.6 about here]

Generation

Lastly the generational difference in adaptation to new technology is perhaps the most significant for the future diffusion of the Internet, and yet the most taken for granted in policy circles. The pattern in Figure 3.7 shows that early adopters in Europe were concentrated among the youngest age groups, with minimal use in most of Europe among the over 65s. This is despite the fact that in many ways the Internet seems well suited to the needs of the elderly, as a fairly sedentary population with considerable leisure time, especially for social networking, leisure hobbies, and services like the home delivery of groceries. The typical age profile may flatten in future since there is a large potential market among the elderly if access to the Internet becomes more commonly delivered through dedicated plug-and-play email units and services like WebTV rather than via more
complex computers, especially given the tendency for the older generation to watch far more television than average. Yet at present the online community in Europe largely excludes the retired population, and the generation gap within the Nordic countries where the Internet has penetrated most widely is the largest of any social cleavage we have observed so far. Overall almost a third of all Europeans under 25 are online, compared with only 3% of the over-65 year olds. The younger generation is already living in a different virtual world to their parents and grandparents.

[Figure 3.7 about here]

The findings so far suggest that the familiar social profile typical of online users in the United States is also evident in Western Europe. Trends in these societies since the mid-1990s confirm that, contrary to the 'normalization' thesis, the resource based inequalities that we have already observed grew as Internet use gradually diffused more widely (Figure 3.8). Multivariate regression models were run to examine the interrelationship between these factors. The results confirm that all the factors discussed in this chapter were significantly associated with Internet use in Europe (see Table 3.3). In particular, the gender and age differences remained important factors predicting Internet use even after controlling for factors like income, education, and occupation, suggesting that resources are only one part of the explanation here. Moreover the national-level country variables usually continued to be significant, even after controlling for all social factors. This indicates that the structure of opportunities within a nation discussed in the previous chapter continues to influence Internet use even after controlling for individual-level differences in occupation and income. That is to say, a well-paid college-educated company manager living in Stockholm or Copenhagen would still be more likely to surf the web or use email than an equivalent colleague working in Madrid or Athens.

Turning to the analysis of changes over time, the multivariate regression models run in 1996 and 1999 confirm that, rather than equalizing, the digital divide between most groups of users and non-users in Europe expanded from the 1996-99, with the exception of the gender gap. The size of the coefficients in 1996 and 1999 show that income, education, occupational status and age become stronger predictors of whether someone was online, with only the gender gap diminishing in strength. Of course the social profile of users may possibly flatten further within the next decade if Internet access spreads even more widely to become available in 85-95% of all households, like VCRs or refrigerators. Nothing that we have said disproves the claims that the 'normalization' thesis could still be true in the longer-term. But the European survey evidence shows a growing divide between the information-rich and poor during the emergent Internet era, in addition to the widening North-South divisions documented in the last chapter, with no evidence yet that these gaps are starting to close in societies where use of the Internet has become most pervasive.
Social Inequalities in the Information Society

The fact that there are absolute differences in access to the Internet is hardly surprising. Yet the question remains whether the relative disparities in access to the Internet are substantially different or similar to the distribution of other common forms of information and communication technology, such as VCRs and cable TV. Like gambling at Rick’s bar, some popular accounts are shocked, shocked to discover social inequalities on the Net. We should not be. As in the previous chapter, the more realistic approach compares the relative inequalities in computers access and Internet use with disparities in the distribution of other forms of technology. The spring 1999 Eurobarometer survey monitored whether people had access to or used ten different types of information technology, including the Internet, as well as video recorders (VCR), facsimile machines, and personal computers. If we establish that patterns of income, educational or occupational inequalities are similar across all types of communication and information technologies, then this suggests broad explanations of this phenomenon relating to deep-rooted patterns of social stratification endemic in modern societies. Households with Internet access can be expected to possess multiple consumer durables for entertainment and communications, such as satellite or cable TVs, pagers and fax machines, home entertainment centers and mobile phones. On the other hand, if the distribution of Internet access differs from use of other types of info-tech, then we should search for explanations based on the distinctive characteristics of the Internet, such as the financial costs of gaining online access, the cognitive skills and computing experience required for surfing, and the way people respond to the type of materials and services available on the Web. Both relative and absolute inequalities can be regarded as equally important from a public policy perspective, but the analysis of the former provides deeper insights into the causes of this phenomenon.

The correlations in Table 3.4 indicate that use of the Internet is most closely related, not surprisingly, with access to related technologies such as a computer, CD Rom and modem. Nevertheless in addition the pattern shows that Internet use was also significantly although more weakly associated with access to non-computer related forms of entertainment and communication technologies, such as use of a fax machine, VCR, or cable TV. Reflecting parallel patterns at national level documented in the last chapter, this suggests that individuals living within affluent households rich in many different forms of consumer durables designed for traditional forms of home entertainment and communication are most likely to also access networked computers. There can obviously be many exceptions, for example less affluent students, poorly paid service professionals...
and office clerical workers are commonly in environments where the Internet is easily available at work even if they lack home access. Nevertheless the overall association between use of computer and other consumer durables implies that broad patterns of social stratification are the major explanation for trends in Internet diffusion.

[Table 3.4 about here]

Multivariate analysis helps to distinguish the relative weight of the factors we have discussed so far. The order of the variables in the OLS regression models followed the standard logic of the classic ‘funnel of causality’\textsuperscript{28}. The demographic variables of age and gender were entered first, followed by the resource variables of household income, education and the respondent’s occupation, the latter coded as manual or non-manual. In addition, given the geographic variations in Internet use established in the previous chapter, the major region of Europe where respondents lived was entered as well, coded as North (1) or South (0). Models were tested with three dependent variables, comparing \% Online, a broader New Media index summarizing access to a computer, CD Rom, modem, as well as the Internet, and an Old Media index including access to other forms of technology including a VCR, fax, satellite TV, cable TV, teletext TV and videotext.

[Table 3.5 about here]

Most strikingly, comparison across the three models shows that similar social and demographic factors explaining online participation also help predict access to all new and old media technologies. The relative strength of the coefficients varied slightly across models, for example education and occupation were slightly more strongly associated with the new than old media. Nevertheless the headline finding is the striking similarities across models. What this pattern implies is that there are certainly social inequalities in the virtual world. As many others have found, use of the Internet – and therefore potential access to the multiple online resources available for information, education and networking likely to lead to economic success and personal advancement – has exploded in many postindustrial societies at the forefront of the information revolution. And yet since the mid-1990s the global divide between leader and laggard nations, and the social divide among sub-populations even within leader nations, have expanded substantially. In Europe, as in the United States, this sweeping tide has left behind many poorer households, manual workers, the less educated, the elderly and women. And yet there is nothing new about these social and regional inequalities in the virtual world, which also characterize access to old media like cable or satellite TV and fax machines.

We often assume that the explanation for the digital divide must lie in certain characteristics associated with proximate access to this technology, such as the need for computing skills and affordable online connections. The policy solutions designed to ameliorate the digital divide commonly focus on just these sorts of fixes, such as wiring schools and classrooms, training teachers,
and providing community access in poorer neighborhoods. Certainly this can do no harm. But will these initiatives work in terms of diversifying the online population? It does not seem likely. The policy fixes are too specific, the problem of social inequalities too endemic. What the analysis in this chapter demonstrates is that the heart of the problem lies in broader patterns of social stratification that shape not just access to the virtual world, but also full participation in other common forms of information and communication technologies. The results suggest that there is no need to try to explain the online gender gap, for example, by theories specific to this type of technology, such as women’s supposed ‘computer-phobia’, attitudes towards computers in the classroom, or the lack of non-aggressive computer games and web sites suitable for young girls. All this may, or may not, be true. But it turns out that these are poor general explanations for why fewer women than men are online, since women are also less likely than men to have access to technologies delivering mass entertainment like cable TV and VCRs. We need to go in subsequent chapters to explore the underlying reasons for the social inequalities established here and the implications for civic engagement and political participation on the Net.
Figure 3.1

% Online by Social Group, US
Source: Pew Spring 2000

<table>
<thead>
<tr>
<th>Category</th>
<th>Online (%)</th>
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<tbody>
<tr>
<td>ALL</td>
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</tr>
<tr>
<td>15-25</td>
<td>58</td>
</tr>
<tr>
<td>26-44</td>
<td>66</td>
</tr>
<tr>
<td>45-64</td>
<td>41</td>
</tr>
<tr>
<td>65+</td>
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<tr>
<td>Less than High school</td>
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<tr>
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<tr>
<td>Some College</td>
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<tr>
<td>College Graduate+</td>
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</tr>
<tr>
<td>Men</td>
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<tr>
<td>Women</td>
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<td>Blacks</td>
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</tr>
<tr>
<td>Hispanics</td>
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</table>
Figure 3.2

% Online

Sweden
US
Denmark
Finland
Neth
Britain
Italy
France
Germany
Greece
Portugal

Spring 1996  Spring 1997  Fall 1998  Spring 1999
Figure 3.3

Income Gap
Source: Eurobarometer 1996 and 1999, EU15
Figure 3.4

% Online by Occupation,
EU-15 Spring 1999

Source: Eurobarometer 50.1
Figure 3.5

% Online by Education,
EU-15 Spring 1999

Source: Eurobarometer 51.0
Figure 3.6:

Gender Gaps
Source: Eurobarometer 1996 and 1999, EU-15

% Online

Portugal  Greece  Germany  Spain  France  Belgium  Austria  Ireland  Italy  UK  Lux  Neth  Finland  Denmark  Sweden

Men'99  Women'99

Men'96  Women'96
Figure 3.7

% Online by Age Group,
EU-15 Spring 1999

Source: Eurobarometer 50.1
Figure 3.8

Change in the % Online by Social Group, EU-15 Spring 1996 and Spring 1999

- Age
  - 15-25
  - 26-44
  - 45-64
  - 65+

- Income
  - Lowest
  - Medium Low
  - Medium
  - High

- Education
  - Up to 15
  - 16-19
  - 20+

- Gender
  - Men
  - Women

- Occupation
  - Managers
  - Other White
  - Manual Worker
  - Home worker
  - Unemployed
  - Student
Table 3.1: Proportion of Internet Users, EU and U.S. 1996-1999

<table>
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<td>6</td>
<td>8</td>
<td>11</td>
<td>+8</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>+7</td>
</tr>
<tr>
<td>Germany West</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>+3</td>
</tr>
<tr>
<td>Germany East</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>+6</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>+6</td>
</tr>
<tr>
<td>Greece</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>+6</td>
</tr>
<tr>
<td>Portugal</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>+3</td>
</tr>
<tr>
<td>EU 15</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>20</td>
<td>+15</td>
</tr>
</tbody>
</table>

Note: The Eurobarometer question asks, “Do you have access to, or do you use, the Internet or World Wide Web.” The Pew survey asks, “Do you ever go online to access the Internet or World Wide Web or to send and receive email?”

### Table 3.2: Proportion of Computer Users, EU and US 1996-1999

<table>
<thead>
<tr>
<th></th>
<th>Spring 1996</th>
<th>Fall 1997</th>
<th>Spring 1999</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>43</td>
<td>62</td>
<td>73</td>
<td>+30</td>
</tr>
<tr>
<td>U.S. (a)</td>
<td>60</td>
<td>66</td>
<td>69</td>
<td>+9</td>
</tr>
<tr>
<td>Denmark</td>
<td>49</td>
<td>61</td>
<td>65</td>
<td>+16</td>
</tr>
<tr>
<td>Netherlands</td>
<td>54</td>
<td>61</td>
<td>64</td>
<td>+10</td>
</tr>
<tr>
<td>Finland</td>
<td>36</td>
<td>43</td>
<td>52</td>
<td>+16</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>41</td>
<td>49</td>
<td>48</td>
<td>+7</td>
</tr>
<tr>
<td>Britain</td>
<td>41</td>
<td>47</td>
<td>45</td>
<td>+4</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>25</td>
<td>34</td>
<td>39</td>
<td>+14</td>
</tr>
<tr>
<td>Italy</td>
<td>31</td>
<td>32</td>
<td>37</td>
<td>+6</td>
</tr>
<tr>
<td>Belgium</td>
<td>28</td>
<td>32</td>
<td>37</td>
<td>+9</td>
</tr>
<tr>
<td>Austria</td>
<td>23</td>
<td>41</td>
<td>33</td>
<td>+10</td>
</tr>
<tr>
<td>Spain</td>
<td>25</td>
<td>29</td>
<td>33</td>
<td>+8</td>
</tr>
<tr>
<td>Ireland</td>
<td>23</td>
<td>27</td>
<td>31</td>
<td>+8</td>
</tr>
<tr>
<td>France</td>
<td>25</td>
<td>34</td>
<td>30</td>
<td>+5</td>
</tr>
<tr>
<td>Germany West</td>
<td>31</td>
<td>32</td>
<td>29</td>
<td>-2</td>
</tr>
<tr>
<td>Germany East</td>
<td>27</td>
<td>32</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Portugal</td>
<td>21</td>
<td>20</td>
<td>22</td>
<td>+1</td>
</tr>
<tr>
<td>Greece</td>
<td>12</td>
<td>19</td>
<td>17</td>
<td>+5</td>
</tr>
<tr>
<td><strong>EU15</strong></td>
<td><strong>31</strong></td>
<td><strong>38</strong></td>
<td><strong>40</strong></td>
<td><strong>+9</strong></td>
</tr>
</tbody>
</table>

**Note:** The Eurobarometer question asks, “Do you have access to, or do you use, a computer.”

**Sources:** Eurobarometers 44.2 spring 1996; 47.0 spring 1997; 50.1 fall 1998; 51.0 spring 1999. (a) US: successive surveys by The Pew Research Center for the People and the Press. See [www.people-press.org](http://www.people-press.org).
Table 3.3: Social Profile of Online Community, EU-15 1996-1999

<table>
<thead>
<tr>
<th>Category</th>
<th>% Online Spring 1996</th>
<th>% Online Spring 1999</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL EU-15</td>
<td>5</td>
<td>20</td>
<td>+15</td>
</tr>
<tr>
<td>AGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH INCOME CATEGORY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>++</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE FINISHED EDUC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-19 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCCUPATIONAL STATUS</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Managers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other White Collar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual Worker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home worker</td>
<td></td>
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<td></td>
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<tr>
<td>Unemployed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
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</table>

Sources: Eurobarometers 44.2 spring 1996; 47.0 spring 1997; 50.1 fall 1998; 51.0 spring 1999
### Table 3.4: Predictors of Internet Use, EU-15 1996 and 1999

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th>1999</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>Sig.</td>
<td>B</td>
<td>R</td>
<td>Sig.</td>
<td>B</td>
</tr>
<tr>
<td><strong>DEMOGRAPHICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.085</td>
<td>.000</td>
<td>-.035</td>
<td>-.168</td>
<td>.000</td>
<td>-.642</td>
</tr>
<tr>
<td>Gender</td>
<td>.058</td>
<td>.000</td>
<td>.588</td>
<td>.052</td>
<td>.000</td>
<td>.327</td>
</tr>
<tr>
<td><strong>RESOURCES</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
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<td>.000</td>
<td>.303</td>
<td>.153</td>
<td>.000</td>
<td>.609</td>
</tr>
<tr>
<td>Income</td>
<td>.055</td>
<td>.000</td>
<td>.783</td>
<td>.141</td>
<td>.000</td>
<td>.439</td>
</tr>
<tr>
<td>Class</td>
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<td>.000</td>
<td>.827</td>
<td>.077</td>
<td>.000</td>
<td>.574</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>.000</td>
<td>-1.43</td>
<td>-.073</td>
<td>.000</td>
<td>-1.72</td>
</tr>
<tr>
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<td>.849</td>
<td>-.035</td>
<td>-.067</td>
<td>.000</td>
<td>-1.30</td>
</tr>
<tr>
<td>France</td>
<td>-.037</td>
<td>.000</td>
<td>-.774</td>
<td>-.057</td>
<td>.000</td>
<td>-1.24</td>
</tr>
<tr>
<td>Spain</td>
<td>-.027</td>
<td>.000</td>
<td>-1.03</td>
<td>-.055</td>
<td>.000</td>
<td>-1.36</td>
</tr>
<tr>
<td>Portugal</td>
<td>-.007</td>
<td>.012</td>
<td>-.563</td>
<td>-.054</td>
<td>.000</td>
<td>-1.44</td>
</tr>
<tr>
<td>Belgium</td>
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<td>.000</td>
<td>-.628</td>
<td>-.052</td>
<td>.000</td>
<td>-1.20</td>
</tr>
<tr>
<td>Austria</td>
<td>-.001</td>
<td>.923</td>
<td>.020</td>
<td>-.041</td>
<td>.000</td>
<td>-.93</td>
</tr>
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<td>Italy</td>
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<td>.000</td>
<td>-.507</td>
<td>-.036</td>
<td>.000</td>
<td>-.91</td>
</tr>
<tr>
<td>Ireland</td>
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<td>.104</td>
<td>.359</td>
<td>-.029</td>
<td>.000</td>
<td>-.73</td>
</tr>
<tr>
<td>UK</td>
<td>.069</td>
<td>.000</td>
<td>.966</td>
<td>.000</td>
<td>.432</td>
<td>.23</td>
</tr>
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<td>Netherlands</td>
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<td>.000</td>
<td>.578</td>
<td>.021</td>
<td>.000</td>
<td>.45</td>
</tr>
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<td>Finland</td>
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<td>.000</td>
<td>.784</td>
<td>.035</td>
<td>.000</td>
<td>.65</td>
</tr>
<tr>
<td>Denmark</td>
<td>.038</td>
<td>.000</td>
<td>.573</td>
<td>.049</td>
<td>.000</td>
<td>.89</td>
</tr>
<tr>
<td>Sweden</td>
<td>.068</td>
<td>.000</td>
<td>.099</td>
<td>.000</td>
<td>.000</td>
<td>1.77</td>
</tr>
</tbody>
</table>

Cox-Snell R2   | .073 | .278 |
Nagelkerke R2  | .209 | .431 |
% Correct      | 94.5 | 83.8 |

**Notes:** The table reports the coefficients predicting use of the Internet based on binary logistic regression models. Use of the Internet is measured as a dichotomy where 1=yes, 0=no. Luxembourg, which is close to the European mean, is excluded from the national dummies. Age (in years). Education (Years finished F/t education). Income (standardized household income scale.) Class (Manual/Non-Manual occupation for the Head of Household). Gender (Male 1/Female 0).

**Sources:** EuroBarometer 47.0 Spring 1996 (N. 65178) and 51.0 Spring 1999.
Table 3.5: European Use of Info-tech (Individual-level Correlations)

<table>
<thead>
<tr>
<th></th>
<th>Internet</th>
<th>Computer</th>
<th>CD Rom</th>
<th>Modem</th>
<th>VCR</th>
<th>Fax</th>
<th>Sat. TV</th>
<th>Cable TV</th>
<th>Videotext</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>0.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CD-ROM</td>
<td>0.59</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modem</td>
<td>0.91</td>
<td>0.67</td>
<td>0.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCR</td>
<td>0.19</td>
<td>0.31</td>
<td>0.26</td>
<td>0.21</td>
<td></td>
<td></td>
<td></td>
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<td>Fax</td>
<td>0.44</td>
<td>0.45</td>
<td>0.43</td>
<td>0.47</td>
<td>0.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satellite TV</td>
<td>0.12</td>
<td>0.14</td>
<td>0.13</td>
<td>0.12</td>
<td>0.12</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable TV</td>
<td>0.14</td>
<td>0.16</td>
<td>0.16</td>
<td>0.15</td>
<td>0.15</td>
<td>0.14</td>
<td>0.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teletext TV</td>
<td>0.19</td>
<td>0.25</td>
<td>0.22</td>
<td>0.21</td>
<td>0.32</td>
<td>0.18</td>
<td>0.16</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Videotext</td>
<td>0.09</td>
<td>0.12</td>
<td>0.11</td>
<td>0.11</td>
<td>0.07</td>
<td>0.14</td>
<td>0.06</td>
<td>0.13</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

Note: Q:"Do you use, or do you have access to…"

Source: Eurobarometer 51.0 Spring 1999 EU-15
Table 3.6: Predictors of Use of Info-Tech, EU-15 Spring 1999

<table>
<thead>
<tr>
<th></th>
<th>% Online</th>
<th></th>
<th>New Media</th>
<th></th>
<th>Old Media</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Sig</td>
<td>Beta</td>
<td>Sig</td>
<td>Beta</td>
<td>Sig</td>
</tr>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>-0.12**</td>
<td>-0.16**</td>
<td>-0.18**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>0.06**</td>
<td>0.05**</td>
<td>0.07**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH Income</td>
<td>0.16**</td>
<td>0.21**</td>
<td>0.25**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.12**</td>
<td>0.15**</td>
<td>0.06**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Manual occupation</td>
<td>0.09**</td>
<td>0.12**</td>
<td>0.06**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North (1) South (0)</td>
<td>0.23**</td>
<td>0.21**</td>
<td>0.25**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.21</td>
<td>0.81</td>
<td>2.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.19</td>
<td>0.26</td>
<td>0.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: The figures represent standardized beta coefficients using OLS regression models.

% Online Have access to/use the Internet or World Wide Web (0/1).

New Media Index 4-point scale measuring use or access to computer+ CDRom+ modem+ Internet.

Old Media Index 6-point scale measuring use or access to VCR+ fax+ satellite TV+ CableTV+ teletext+ videotext.

** Sig. P.= .01

Source: Eurobarometer 51.0 Spring 1999.


15 In the last few years a number of market research companies have sought to monitor the potential of the Internet for e-commerce and advertising. Regular cross-national surveys of e-commerce have been conducted by IriS/MORI in 20 nations, by National Opinion Polls (N O P) in Britain, Germany and France, and by ACNeilsen Netwatch in 16 nations. Wherever possible, and these results are used to cross-check the analysis presented in this study. In addition GVU’s WWW User Surveys include some geographic information about users from 1994-1998 but this is not based on a random sampling method and surveys have not been published in the last two years.
The Eurobarometer series has been conducted among a representative sample of the population in all EU member states. I am most grateful to the European Commission’s DG 10 for Information, Communication, Culture and Audiovisual-Unit Public Opinion Monitoring (X.A.2) for release of these dataset, without which this book would not have been possible. More details are available at http://europa.eu.int.


OECD. 2000. Information Technology Outlook. Paris: OECD. Figure 7 p86.


The statistical difference between groups was measured by ANOVA. In Greece the difference by income group proved statistically insignificant, in large part because so few Greeks were online from any social sector.

The June 1995 Pew survey reported that the US online population split almost evenly between those gaining access from home (19%) or work (15%). In contrast the September 1999 Pew Survey found that there was a greater edge for home access (37%) over work access (21%). See The Pew Research Center for the People and the Press. June 2000. ‘Internet Sapping Broadcast News Audience’ http://www.people-press.org/media00rpt.htm; Similar trends towards home access have been found elsewhere, see OECD. 2000. Information Technology Outlook. Paris: OECD.


It should be noted that OLS results are presented here and the analysis was confirmed by logistic regression analysis in Table 3.4, producing identical results.

There is some ambiguity in these items whether they refer to use at home or work or both. It should be noted that Eurobarometer 50.1 asked users whether they had access at home or at work to different types of technology, like a computer. The results suggest that in the other surveys respondents based their answers on their home use. If so, this measure may considerably underestimate the total proportion of computer users and online users in Western Europe.

It should be noted that published estimates about the number of computer users differ considerably. There are also important differences in question wording, as well as fieldwork, in the US and EB sources which hamper strict comparability. Items have been selected which are functionally equivalent although not identical. Nevertheless the comparison of Eurobarometer and Pew surveys over time should increase the reliability of the estimates of change.