



**Electronic Commerce and  
New Ways of Working  
outside  
the European Union, the United States, and  
Japan**

by:

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# 1 E-Commerce and New Ways of working in other Non-European Countries

## 1.1 Introduction

The following section explores the topics of e-commerce and new ways to work as they relate to ten countries outside the European Union, the United States, and Japan. These countries represent potential major powers in the economic landscape of the future. They include the largest countries in Asia (China and India); the so-called Asian Tigers of Southeast Asia (Indonesia, Malaysia, Singapore, Philippines, and Thailand); the main forces in South America (Argentina and Brazil); and one other member of the OECD, Australia.

*The available data concerning e-commerce and new ways to work are considerably more sparse for these countries than for Europe and the United States. They are basically non-existent for some of the Asian countries covered here. Consequently, a substantial portion of the quantitative aspects of this report relies on input data from the World Bank (1999 World Development Indicators) and the outputs of a mathematical forecasting model developed by JALA international, Inc.<sup>1</sup>. In general, reliable data are only available, if at all, for 1997 and 1998. Therefore, the results presented here should be viewed primarily as strong indicators of the current and future situations in these countries rather than as the results of in-depth surveys within the countries.*

A chart showing the changes in composition of the workforce is shown for each of the ten countries in this report. All the charts show four-sector distributions rather than the “normal” three-sector analyses, since the growth of the information sector of each economy is critical to the main themes of this report.

Both the telework and e-commerce models are built upon the primary assumption that the pattern of developments in other countries will follow those of the United States in terms of historical changes. Thus, the charts describing the growth for these countries show a nominal pattern modeled after the nature of developments in the US but possibly shifted in time.

The telework charts also have an additional curve or curves that serve to correct for differences between the US and each country in per capita purchasing power and in the cost of telecommunications, particularly for Internet access.

Finally, the report for each country includes a brief discussion of some of the special factors, usually political and economic, influencing the growth of these activities.

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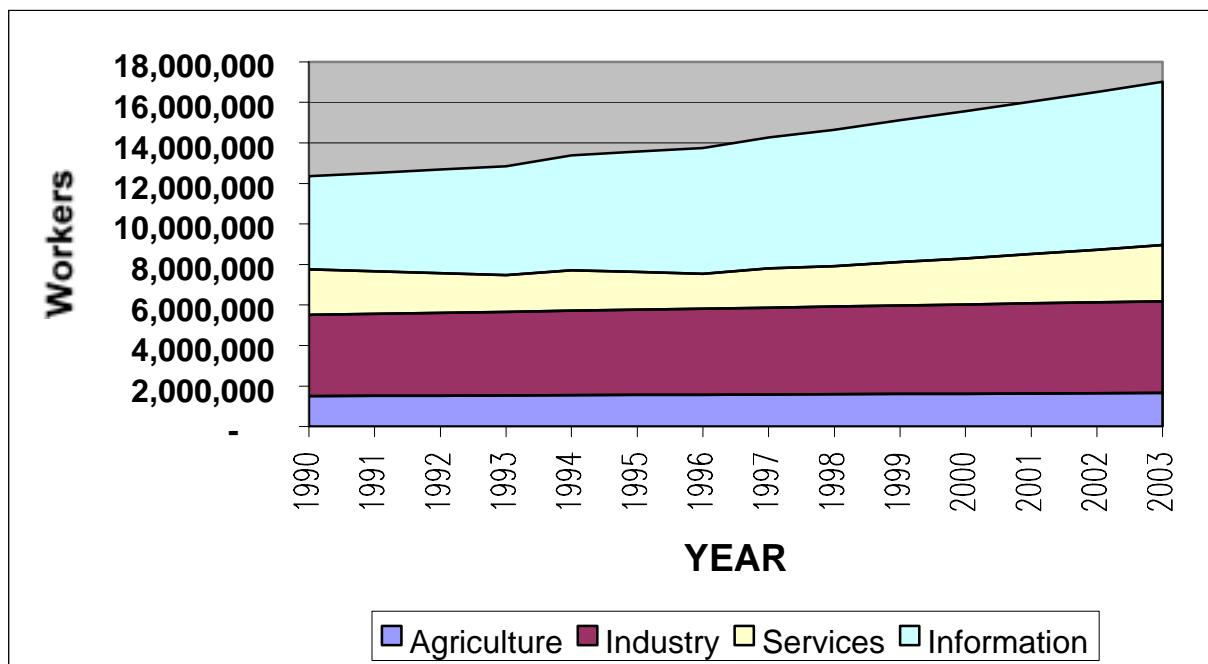
<sup>1</sup> <http://www.jala.com>

## 2 Argentina

### 2.1 The economy

Argentina is often considered to be the most European, and one of the most developed, of Latin American countries. This is evident in an analysis of the composition of its workforce. Figure 1 shows the four-sector analysis of the workforce and its likely growth patterns.

Figure 1: Estimated composition of the workforce in Argentina



The strong and growing information sector is an indicator of likely long-term growth both in e-commerce and new ways to work.

As in the rest of the world, the Internet has been well received in South America. Although the total numbers are still relatively low, roughly 8.5 million Internet users in 1998, annual growth rates are high — approaching 800 percent. Similarly, the number of Latin American Web sites is approaching 500,000.

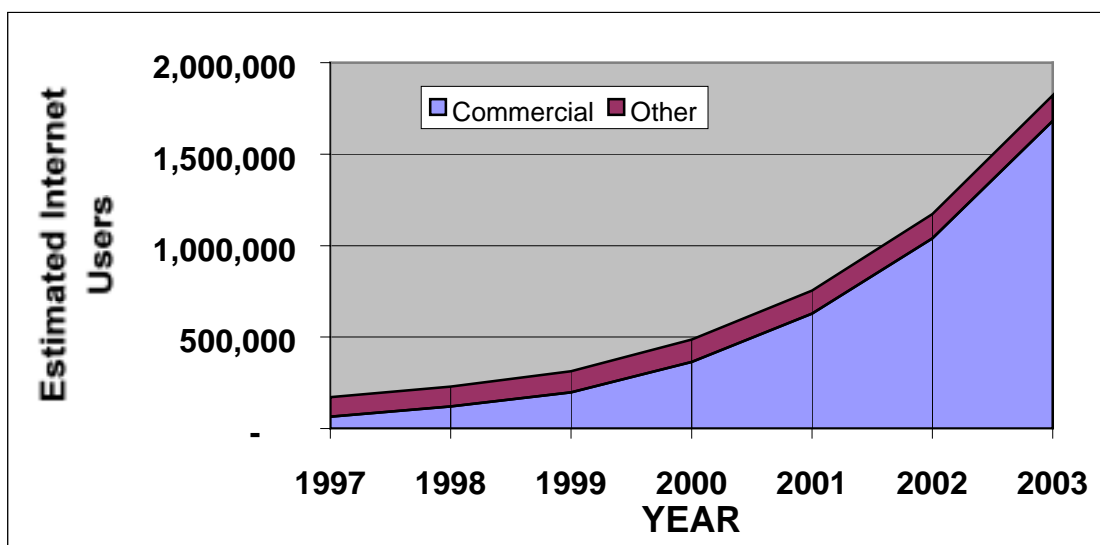
However, like many countries in this transition period, growth in Internet usage in Argentina has been hampered by the relatively high cost of telecommunications. For example, Telintar, the long distance monopoly, was charging up to \$32,000 monthly for a 64 kbps international link before the telecommunication reforms began in 1997. The post-reform price for the link in 1998 was \$2,000. In mid-1999 the average monthly charge for Internet access, including ISP and telephone costs, was USD54—more than double the cost in the US.

Another barrier to Internet growth in Argentina is the lack of Spanish content Web sites, particularly those with local content. In 1998 there were only about 4,000 Argentinean Web sites. The absence of local content, or the prevalence of English-only content, is a

strong deterrent to curiosity of potential Internet users. The lack of region-specific content makes the country dependent on its higher cost international connections for access to information.

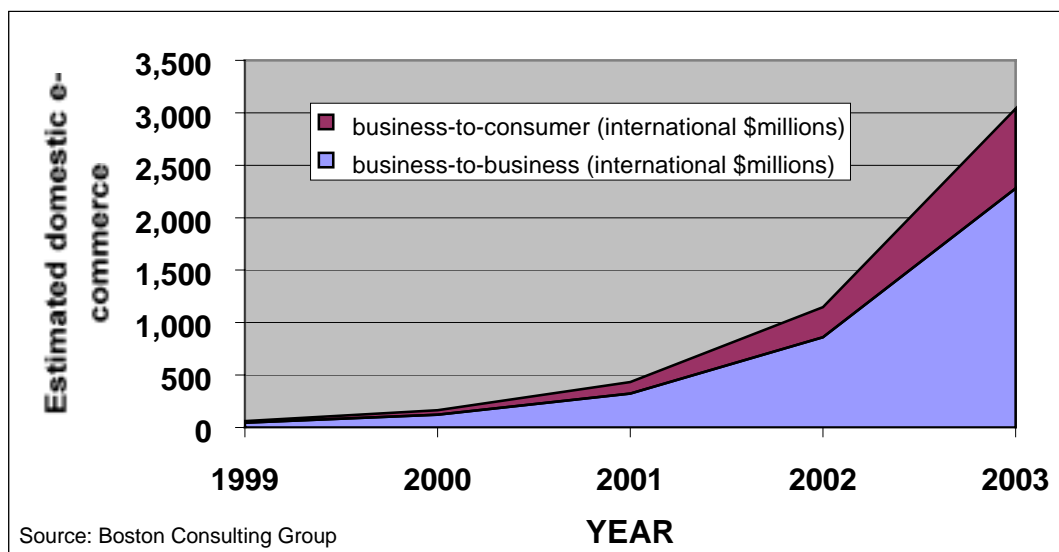
In 1997 the privatization process began in earnest. By the end of 1999 there will be an additional two telecommunication carriers competing for business in Argentina. Furthermore, subscribers will then be able to choose their local and long distance carriers. The fixed network will be completely digital. The consequences of this began to be felt in increased Internet growth in 1997. In addition to the rapid growth rate of Internet access, possibly accelerated by decreasing telecommunications costs, the number of main telephone lines and mobile telephone connections also has been growing rapidly. Our current estimate of the Internet access status and future is shown in Figure 2.

Figure 2: Estimated changes in Internet usage in Argentina.



## 2.2 e-commerce

Figure 3: Domestic electronic commerce in Argentina



It is difficult to find any evidence of electronic commerce in Argentina of a magnitude similar to that occurring in United States and the EU countries, since the financial services infrastructure is not yet ready to support extensive e-commerce activities. Most of the emphasis to date is upon business to consumer e-commerce, with little public evidence of business-to-business e-commerce.<sup>2</sup> Still, as the growth rates of networked computers and Internet access continue, significant levels of electronic commerce should begin to appear in the next few years. Figure 3 provides our current estimate of the status and future course of electronic commerce in Argentina. The figure only shows domestic e-commerce activity; a roughly equivalent volume is expected in international e-commerce.

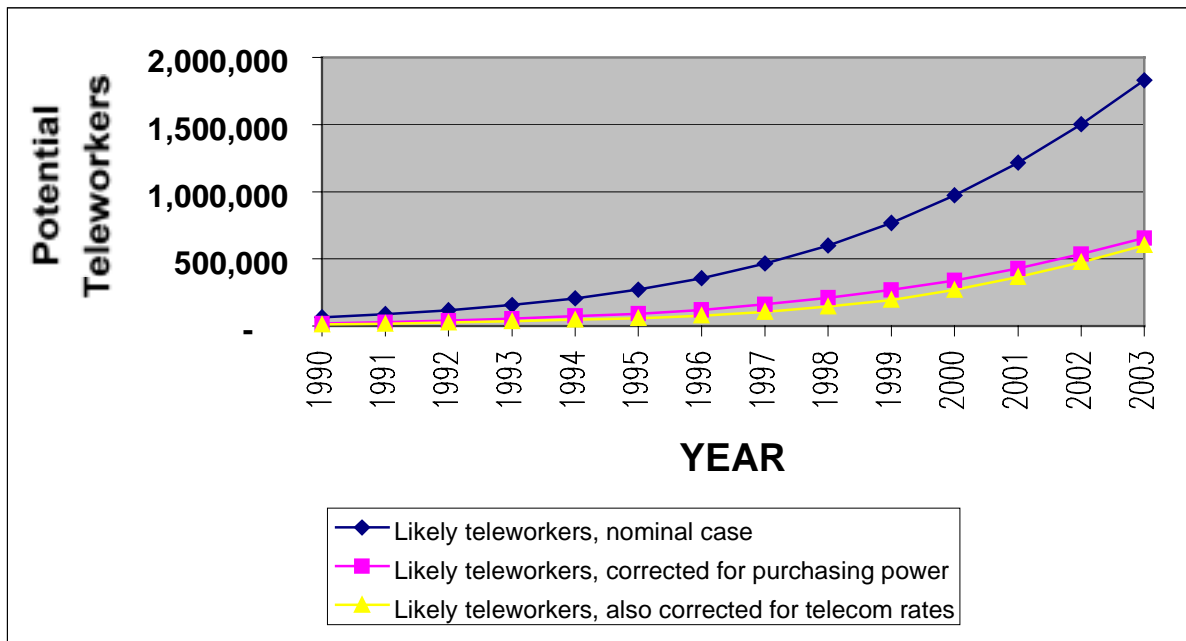
## 2.3 New Ways to Work

Approximately one-third of Argentina's population lives in the Buenos Aires vicinity. Like most large cities, with a population estimated at over 12 million in the year 2000, traffic congestion is a growing problem, as is interest in telework. The current forecast for telework in Argentina is shown in Figure 4. Unfortunately, no survey data are available indicating actual status.

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<sup>2</sup> Ingram-Micro, one of the case studies for this report, is represented in Argentina, as are many other multinational corporations.

Figure 4: Estimated growth of telework in Argentina



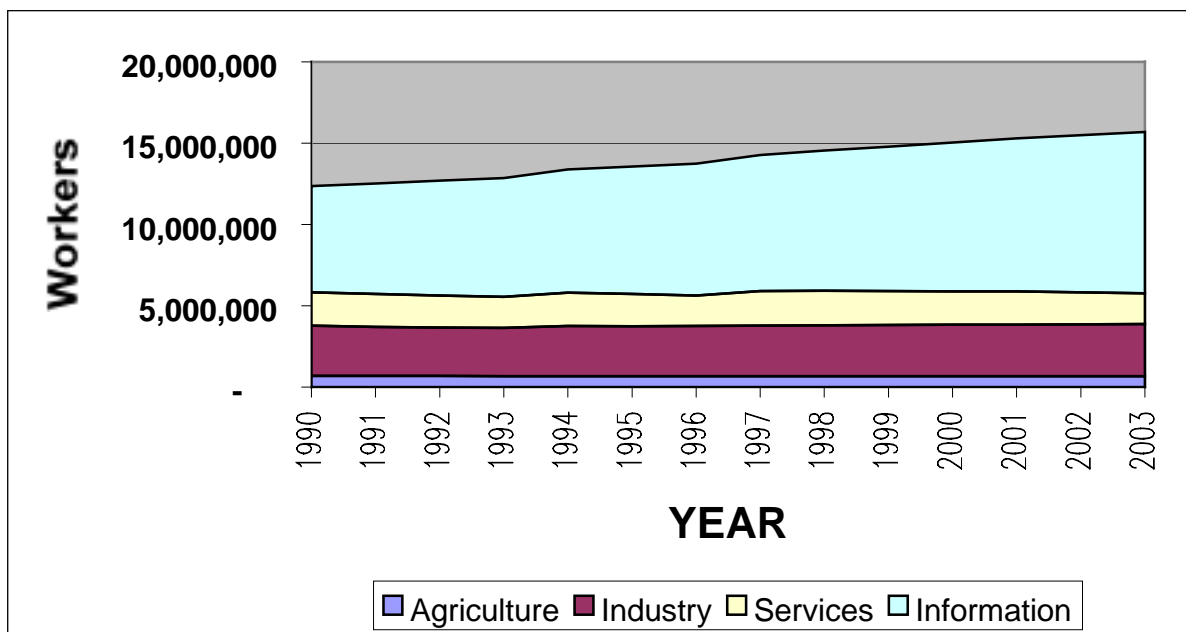
The Argentina government hosted a seminar on telework in 1995 and there has been some effort in the private sector to promote more telework, but no implementation projects have grown to the point where they have received public notice.

## 3 Australia

### 3.1 The economy

Unlike the other countries in this supplemental report, Australia is a member nation of the OECD (Organisation for Economic Co-operation and Development), the so-called developed world. Like most of the OECD countries, the majority of Australia's workers are information workers, as shown in Figure 5, with agricultural, fishing and mining employment at less than 10% of the workforce. The GNP per capita ratio (relative to that of the United States) is about 0.67 in purchasing power terms.

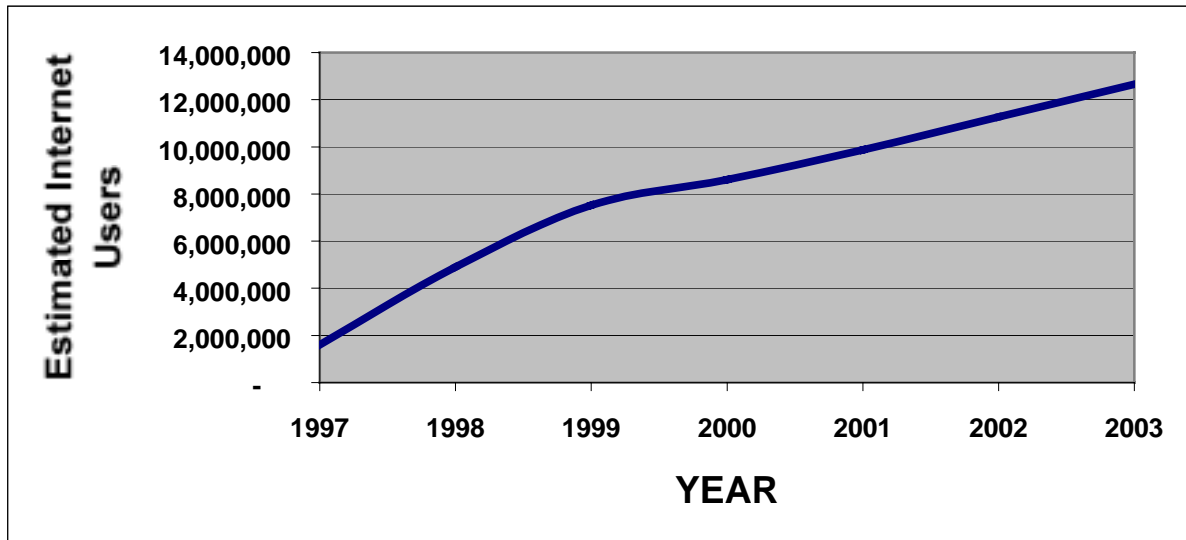
Figure 5: Estimated composition of the workforce in Australia



The telecommunications industry was deregulated and opened to competition in 1992. By February 1999 18% of all Australian households (1.3 million) had Internet access from their homes—a 50% increase over the prior year and comparable to the household Internet penetration in the United States (although less than that of Finland). The Internet usage forecast is shown in Figure 6.

Although the Internet is quite popular, the cost of a telephone call to the US is still high, about 16 times the cost of a local call. This necessarily has some effect on both call frequency and duration, at least until (and if) Internet telephony becomes widespread.

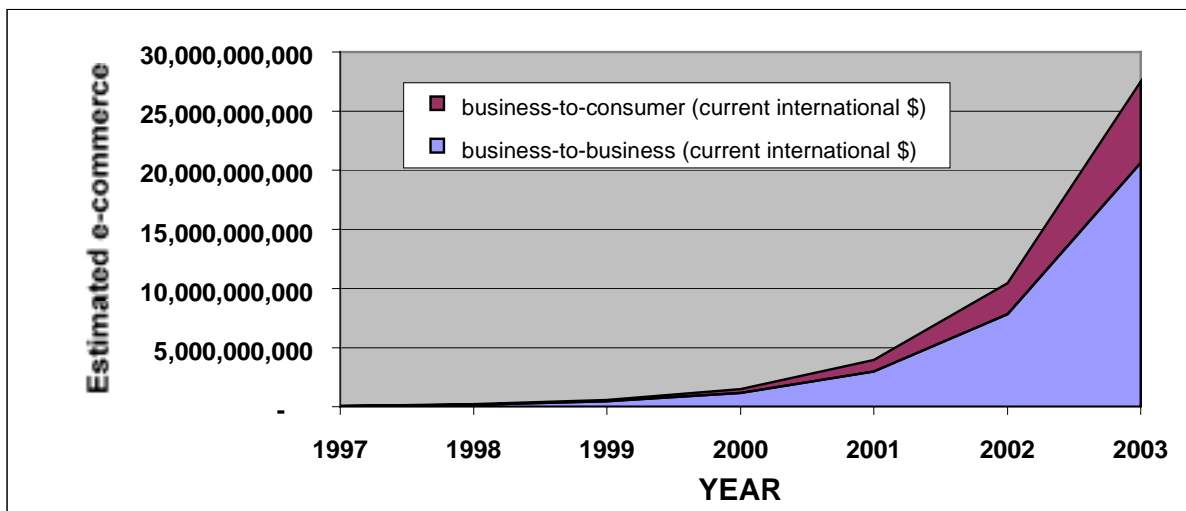
Figure 6: Estimated Internet users in Australia



### 3.2 E-commerce

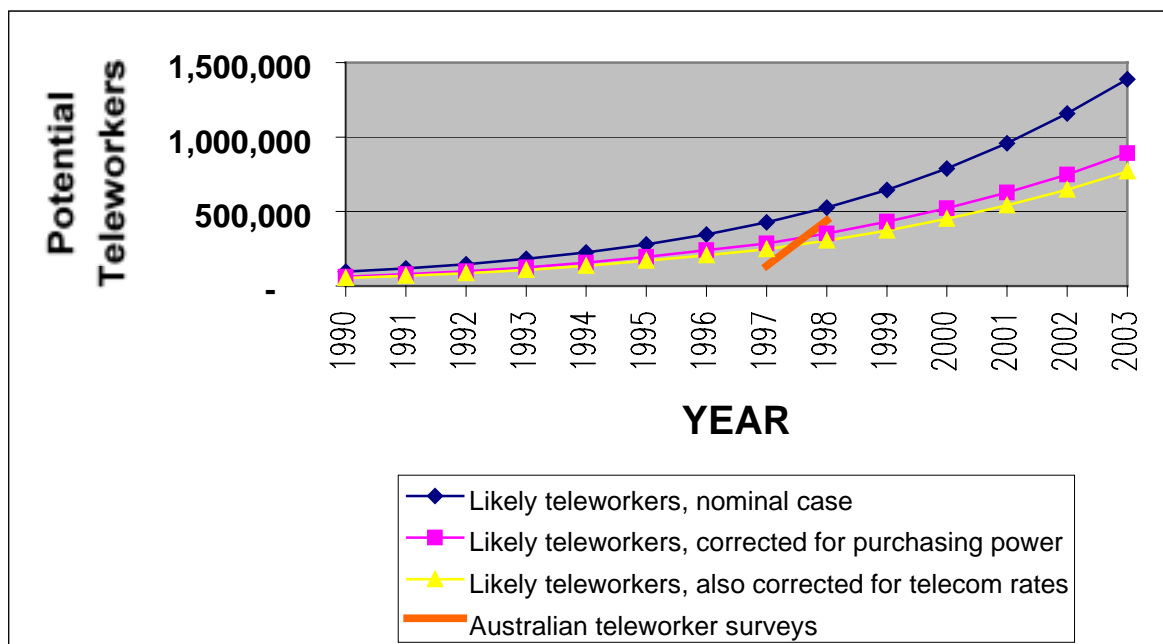
Electronic commerce activity in Australia began to expand rapidly in 1998, more than doubling over the USD83 million value in 1997. That growth rate of about 260% annually is expected to continue for the next few years. As in the US, the dominant portion of the e-commerce volume will be in business-to-business trade rather than the more publicized business-to-consumer e-commerce. Figure 7 shows the anticipated growth of e-commerce in Australia.

Figure 7: Electronic commerce in Australia



### 3.3 New Ways to Work

Figure 8: Estimated growth of telework in Australia



Australia has been involved in various modes of telework for at least half a century, for both conventional work as well as education, if the outback radio communications system is included in the definition. For the more restrictive telework-with-computers version, Australians have been developing programs since, or before, the mid-1980s. Australian Telecom (now Telstra) and the central government have been assisting development by advocating telework programs and supporting symposia throughout the country. Figure 8 shows the results of the forecast model for Australia, together with the results from the summer (February) surveys of home-based teleworking carried out by the Australian Bureau of Statistics in 1998 and 1999. The country appears to have been well below its forecast potential prior to 1998 but also seems to have more than recovered lost ground in 1998. Quite possibly future growth will be at or even above the nominal growth curve. In any case, the 1998 values are within the performance parameters produced by the forecasting model.

## 4 Brazil

### 4.1 The economy

Like Argentina, Brazil's entry into the information age is hampered by low average income, high telecommunications prices, and considerable instability in financial markets. Brazil is at a greater disadvantage than Argentina since the average GNP per capita is only 63% of Argentina's. However, Brazil's large population can more than make up in numbers what it lacks in percentages, when compared with other countries. As can be seen from Figure 9, the information component of the Brazilian workforce is proportionally lower than that of more developed countries, but still constitutes a substantial number—about 11.5 million in the year 2000.

Also like most countries in the world, the telecommunications infrastructure historically was government owned. A holding company, Telebrás, controlled all the 28 operating subsidiaries in Brazil. The federal government of Brazil was the controlling shareholder. Telebrás was broken up in 1998 as part of Brazil's telecommunications deregulation and privatization process and the federal government sold its shares to private concerns. Prior to 1995 the government closely restricted Internet access but, in 1995, first allowed commercial access to the Internet. Still, the international carrier, Embratel, charged significantly higher rates for calls originating in Brazil, thereby acting as a barrier to international Internet access by Brazilians. The cost of a telephone call to the US from Brazil is 156 times the cost of a local call. Figure 10 shows the estimated number of Internet users.

Figure 9: Estimated composition of the workforce in Brazil

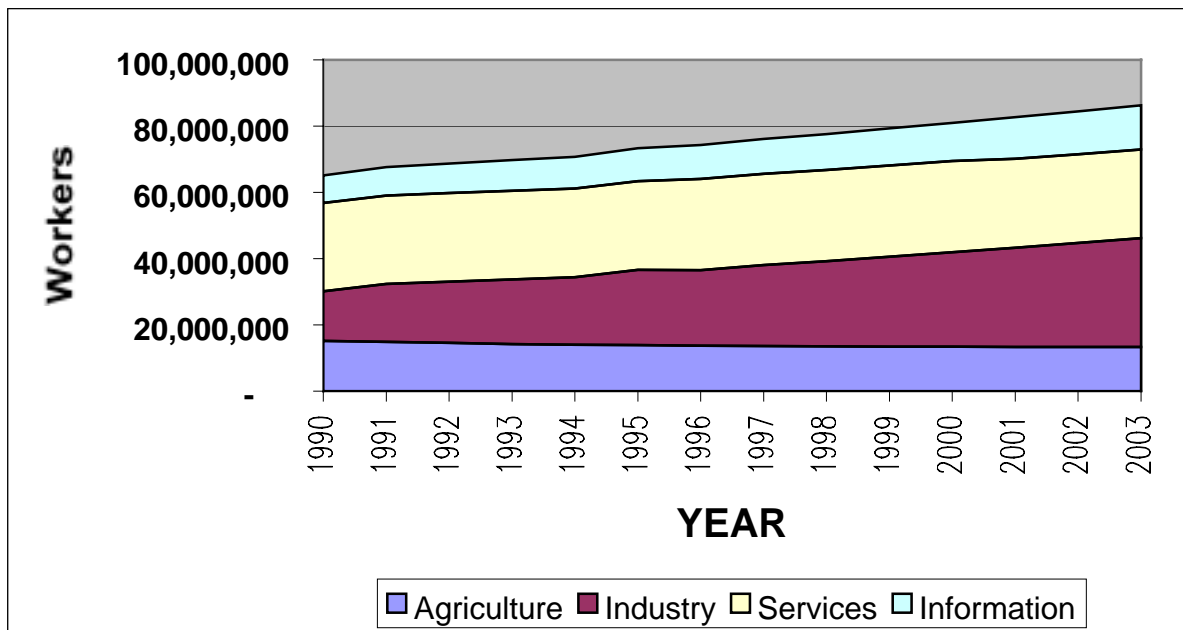
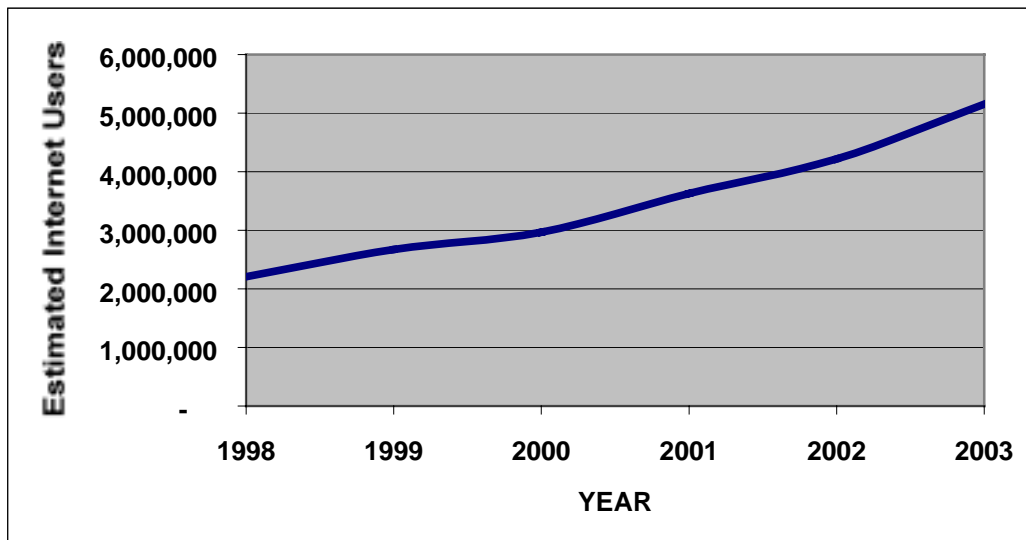


Figure 10: Estimated Internet users in Brazil



Curiously, an explosion of interest in the Internet was triggered by a popular Brazilian soap opera in 1995. The *novela*, titled *Explode Coração*, had both heroes and villains connected via the Internet. With a TV audience share of 50%, reaction to the series resulted in increased pressure on the government to ease Internet access. It also stimulated the initiation of a similar series on, rather than about, the Internet.

## 4.2 E-commerce

Brazil has taken the lead in facilitating electronic commerce within Latin America. As one of the largest Internet users among developing nations, with an 88% share of Latin American e-commerce, Brazil has proposed many modifications to a WTO (World Trade Organisation) study program geared toward analyzing all aspects of e-commerce pertaining to Latin America. The Brazilian government is particularly concerned with import taxes charged on e-commerce related activities.

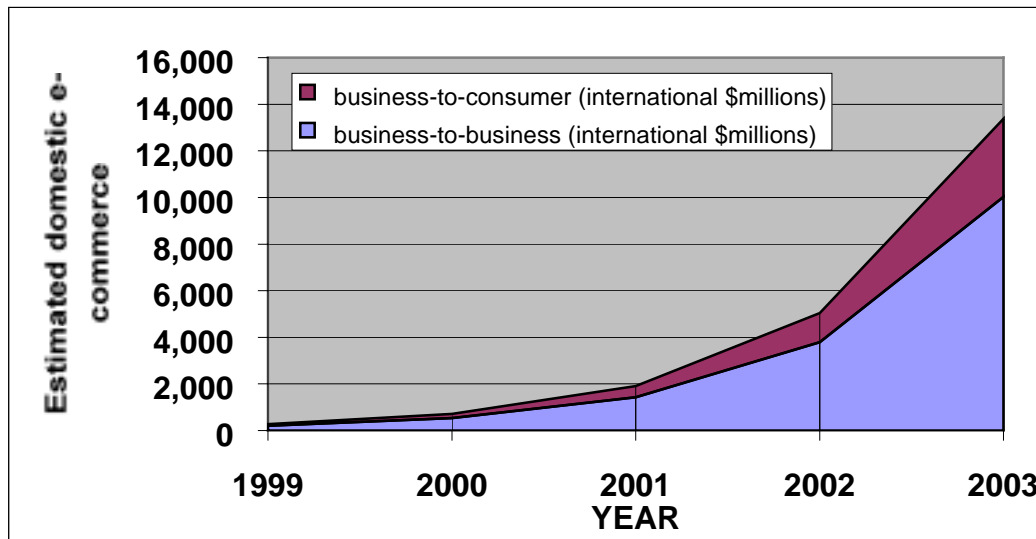
In spite of its worries, the Brazilian government, along with a variety of Brazilian companies, continues to pursue its interests in electronic commerce. In fact, MSS Telecommunications, an electronic commerce company representing AT&T's interests in Brazil, is in the process of creating an Internet site in which information will be available on all Brazilian companies that are seeking to sell their products online. The site, known as Tradegate, ([www.tradegatebr.com](http://www.tradegatebr.com)) illustrates production, commerce, and service opportunities available in Brazil in a web-based format.

Large companies are taking advantage of electronic commerce opportunities as well. Volkswagen do Brasil has established an extranet computer network in order to create electronic links with all of its suppliers. The supplier network was scheduled to be fully functional by June 1999. As mentioned in one of the case studies for this project, Ingram Micro also has affiliations in Brazil.

Bradesco, a leading private sector bank that has helped launch electronic commerce systems throughout Brazil, has reported positive results in conjunction with its partnership with Brazil's Di Monaco chocolate factory in Sao Paulo. On average, Di Monaco reports receiving 150 electronic orders per day at an average price of USD16 per order. Overall,

orders received via electronic commerce represent one-half of all orders to the factory. Bradesco acquired a 30% stake in the operations of the Brazilian subsidiary GE Information Services do Brasil. The acquisition will allow Bradesco to offer electronic data interchange services (EDI) to its 500,000 corporate clients. According to industry analysts, this acquisition will establish Brazil as the forerunner of electronic commerce integration among Latin American countries.

Figure 11: Electronic Commerce in Brazil.



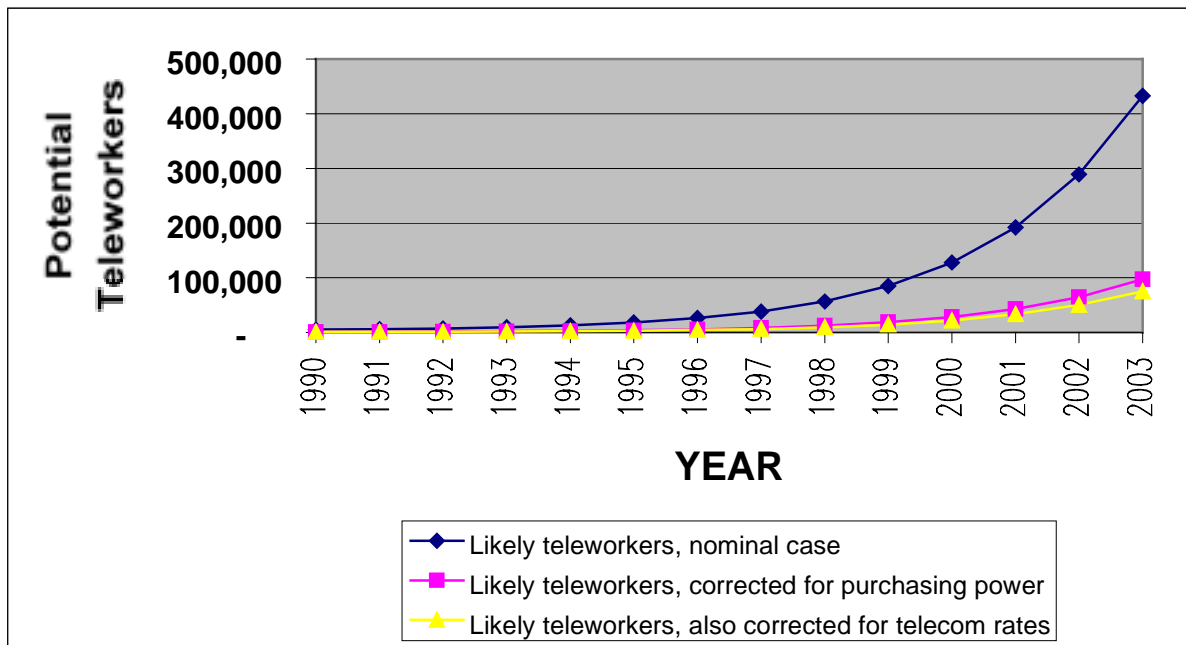
While Brazil is considered to be at the forefront of electronic commerce in Latin America, there have been a few setbacks within Brazilian firms in regard to realizing economic gains from electronic commerce applications. In fact, business-to-consumer sales have fallen below the expected volume for many of the Brazilian virtual shopping centers. Analysts cite a lack of security as a consumer hurdle, and as a result, the administrators of these virtual shopping centers are investing in Internet security measures. Brazil has a proportionately higher number of web sites in its dominant language than does Argentina, thereby easing the entry of new e-commerce users.

Figure 11 shows the current estimate of domestic electronic commerce in Brazil. Like Argentina, the level of electronic commerce with firms outside Brazil is likely to be of slightly higher than comparable size.

### 4.3 New Ways to Work

Although there was a 1999, EC-sponsored, symposium on telework in Rio de Janeiro, there is no reliable source of information on the extent of teleworking in Brazil. Consequently, the information in Figure 12 is entirely the result of the analysis of Brazil's economy and workforce.

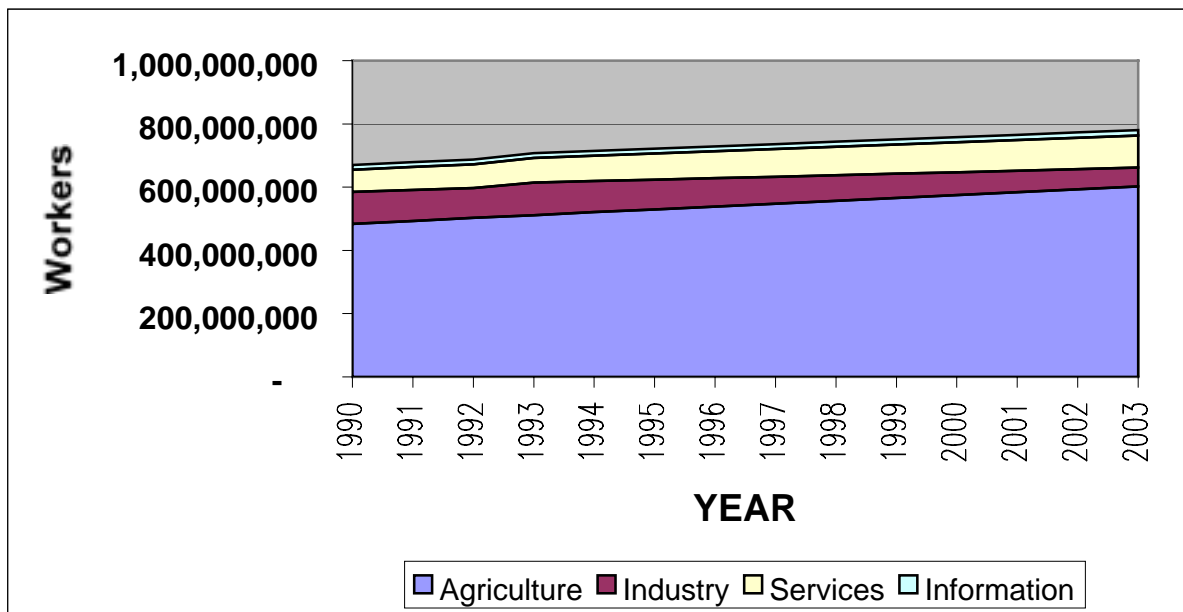
Figure 12: Estimated level of telework in Brazil



## 5 China

### 5.1 The economy

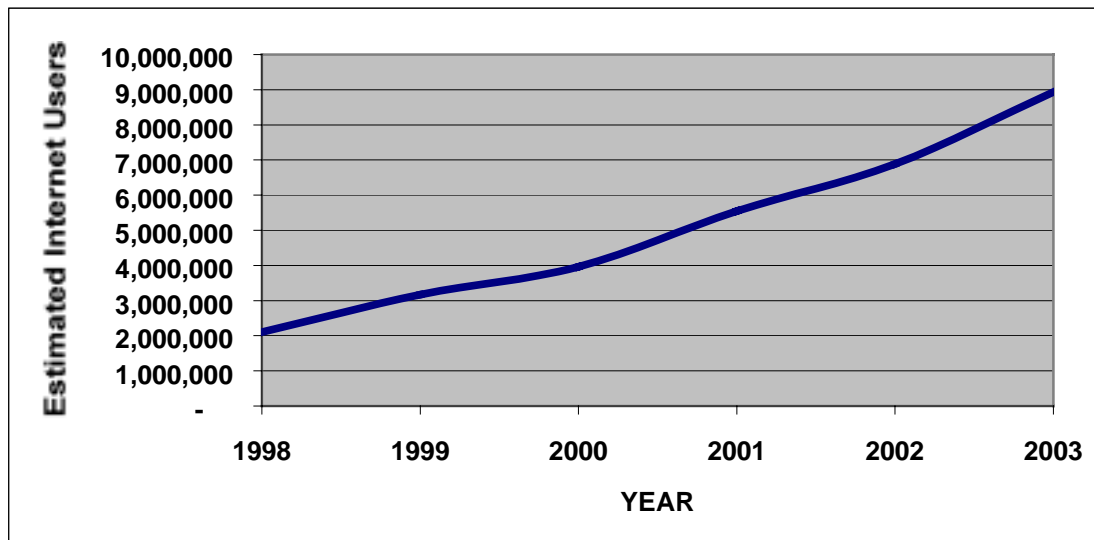
Figure 13: Estimated composition of the workforce in China



China is often called the world's largest sleeping giant. With a population of more than 1.25 billion, China comprises 20% of the world's population. Yet it is still definitely a developing country. Three-quarters of its workforce is engaged in farming and, although economic growth has been rapid in the past decade, GNP per capita is only about 12% of that in the United States, measured in purchasing power terms. Further, the country is in a recession, with 45% of state-owned industries losing money. Nevertheless, it has a growing information sector, as well as a continuing migration from the countryside to the cities. Figure 13 shows the expected changes in the composition of China's workforce.

Although the information sector appears to be a small sliver in Figure 13, it amounted to 16 million people by the end of 1998, one-fifth the size of the US information workforce.

Figure 14: Estimated Internet usage in China



While it might be said that the lack of telecommunications infrastructure (89 telephones per 1,000 population) is a handicap, it can also prove to be an advantage in China. Since there is essentially no antiquated plant to renovate, the network can develop digitally from the outset. The Chinese government began accelerating the development of the infrastructure to an annual growth rate of nearly 30% in 1998, while population growth is less than 1%. Still, the infrastructure is highly regulated, with heavy surcharges on international telecommunications (the charge for a three-minute phone call to the US is more than 600 times the cost of a local call), although local Internet access is very inexpensive. Furthermore, the government controls all telecommunications and tightly regulates Internet access to "undesirable" sites.

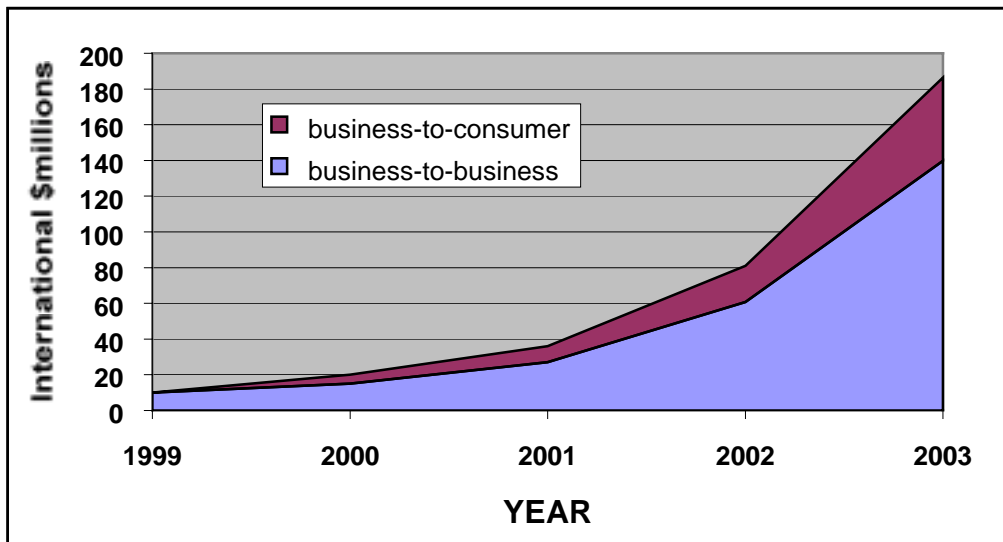
Nevertheless, privately operated ISPs and web sites are coming on line and Internet use is growing rapidly in China. Figure 14 shows the trend, with 9 million Chinese 'Netizens' expected by the end of 2003.

## 5.2 E-commerce

There was very little active e-commerce in China as of mid-1999 but a number of tests were underway, from electronic banking with the Bank of China to some business-to-business trials by mainland Chinese firms. However, a number of factors inhibit the growth of e-commerce, ranging from regulatory issues to such fundamentals, for business-to-consumer e-commerce, as limited credit card use and security concerns. Multinational companies such as Hewlett-Packard (HP) are helping to solve the security issues. HP is also working with the Shanghai municipal government to develop an "e-commerce laboratory" to test and evaluate new e-commerce transaction technologies before they are made generally available.

Nevertheless, extensive levels of e-commerce in China appear to be several years away. Figure 15 shows our estimates for the country.

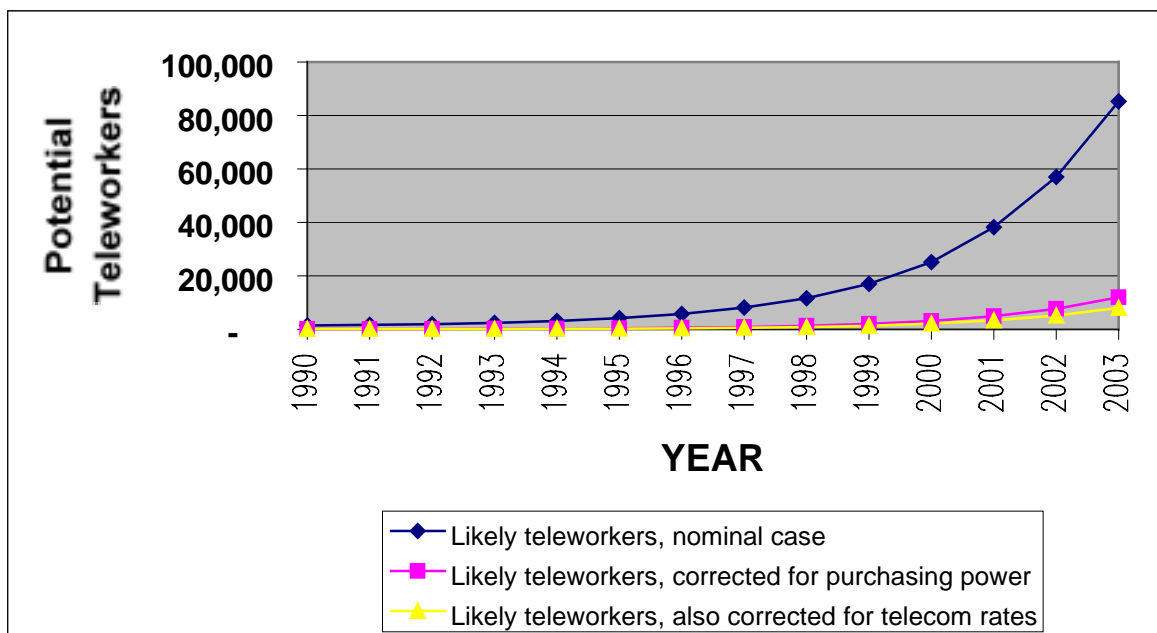
Figure 15: Estimated value of China's electronic commerce



### 5.3 New Ways to Work

Although data regarding telework in China are almost as scarce as those for e-commerce, it is possible to make some predictions of the growth of telework, based on decades of experience in the US. The current forecast is shown in Figure 16.

Figure 16: Estimated development of telework in China



Note the relatively high level of uncertainty here. If China were to follow the same development patterns as the US it might have as many as 85,000 teleworkers by the end of 2003. However, if matters are left to the private sector, the entry and telecommunications costs of telework could drastically reduce that number—to less than

10,000. The Chinese government shows much more interest in e-commerce than in telework.

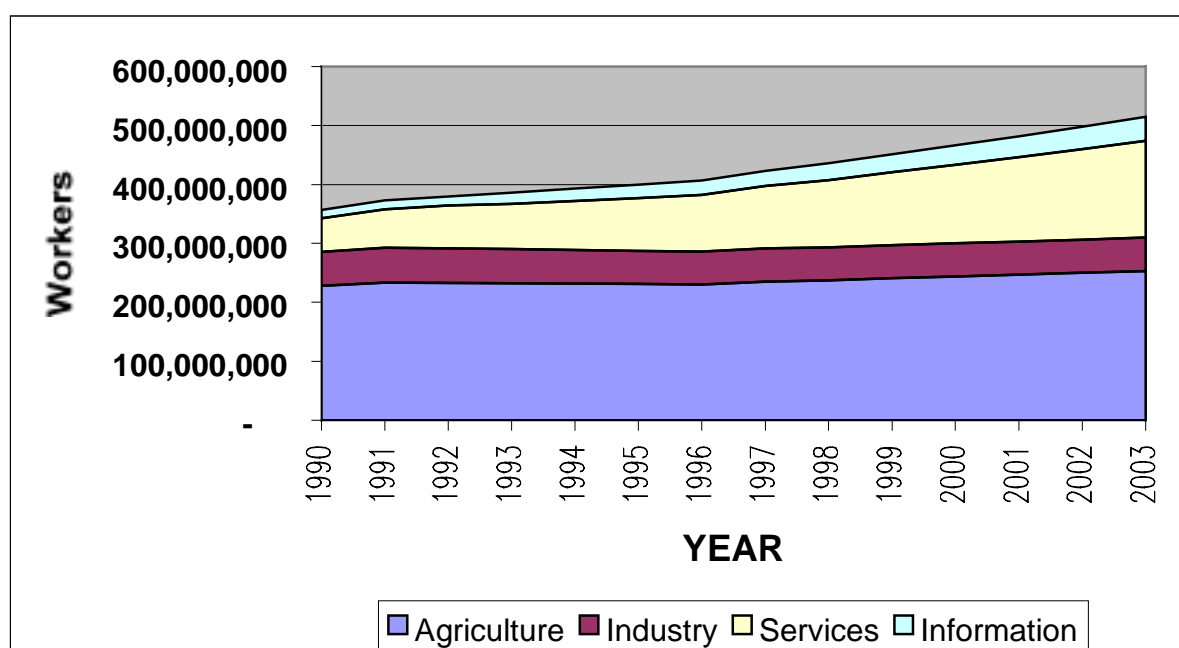
## 6 India

### 6.1 The economy

Like China, India has a huge population—just short of one billion by the end of 1999—with more than half its workforce in agriculture. Most expectations are that both the agricultural and industrial sectors will continue to decline in terms of their proportions of the workforce, while services and information will expand their shares, as shown in Figure 17.

With only 15 telephone lines per 1,000 people in 1996, the number is expected to increase to 27 per thousand by the end of 1999. As in most developing countries, the greatest proportion of these phone lines goes to businesses and wealthier residents. Nevertheless, interest in the Internet is high and growing rapidly, as shown in Figure 18.

Figure 17: Estimated composition of the workforce in India

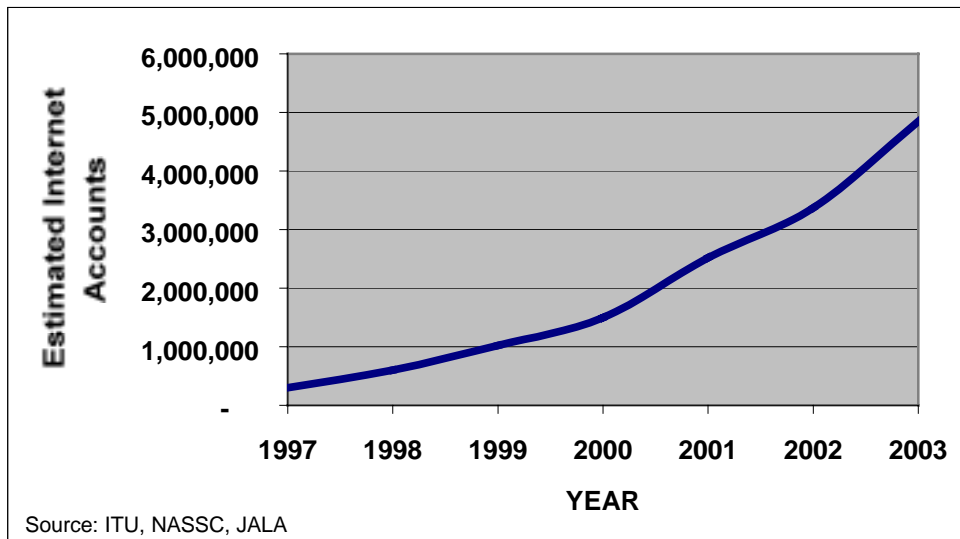


Although the figure shows the expected number of accounts, the number of actual users is probably 4 times that value (e.g., 6 million users vs. 1.5 million accounts by the end of the year 2000).

The first dial-up email network was established in India in 1987, connecting two institutes in Mumbai (Bombay). The network was expanded by a link to Amsterdam in 1988, followed by a satellite link in 1994. Commercial Internet access was introduced in August 1995. However, the telecommunications network and Internet access in India was controlled by a government regulated monopoly, involving four different companies, until November 1998. In a matter of weeks after the end of the monopoly, 41 companies signed up to be ISPs, seven of which were to provide national coverage. According to India Internet World, 13 prospective ISPs are targeting states and major metropolitan areas; 21

are concentrating on the larger cities. That is, most of the activity is directed at providing services only for urban areas. By mid-1999 India had licensed 132 private ISPs.

Figure 18: Estimated Internet accounts in India

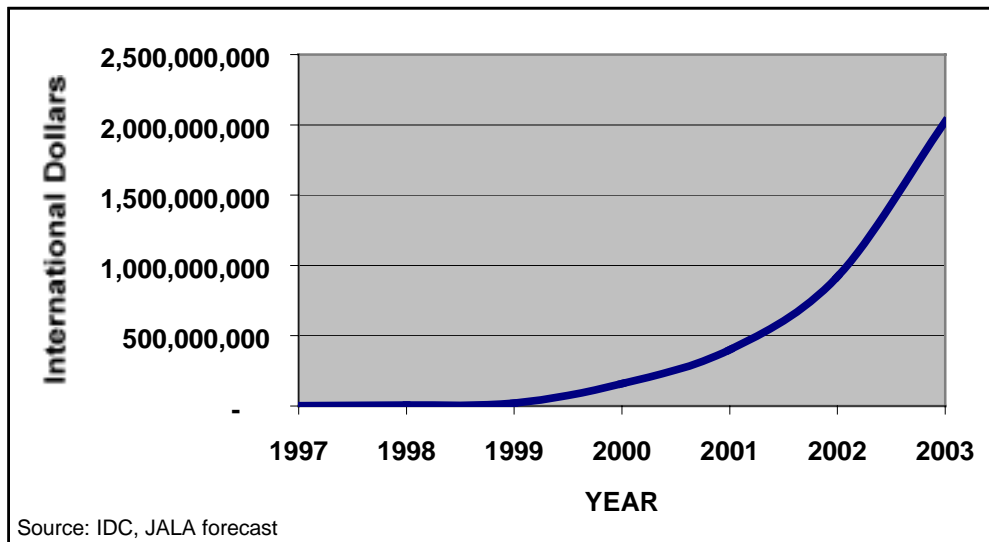


Long distance telephone calls and Internet access are still very expensive, in purchasing power terms, with a phone call to the US costing about 280 times the fee for a local call in India. In 1997, the monopoly ISP was charging USD450 for 500 hours of connect time with a graphic browser and USD140 for text-only browsing. Per capita GNP is only 6% of that in the US, in purchasing power terms. That barrier and the fact that there are at least ten major language groups and many dialects spoken in India, together with an adult literacy rate just above 50%, constitute serious impediments to the potential of information technology for development—at least in percentage terms. Yet, simply because of its size, India is likely to be a major player in the future e-world.

## 6.2 E-commerce

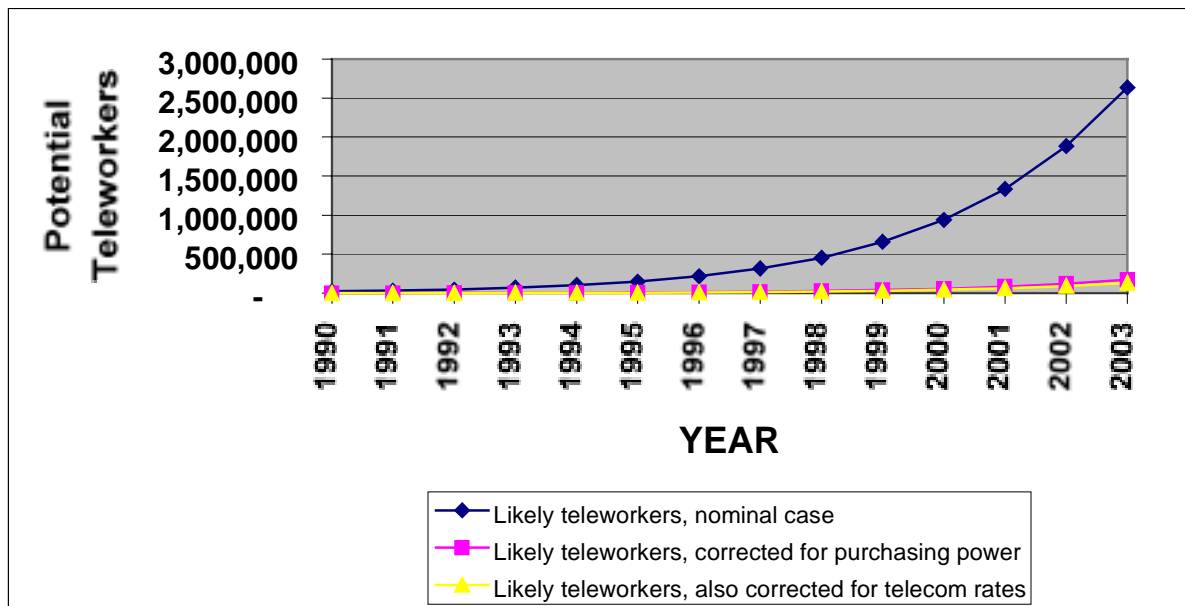
Electronic commerce is still in its infancy in India. For the reasons just stated, growth has been slow, confined to a few major cities and some industries, usually those with multinational companies. With the 1998 opening of the Internet market, however, a large number of new entrants have appeared. Still, as Figure 19 shows, the major boost in e-commerce is not expected until the year 2000 and beyond. The National Association of Software and Service Companies (NASSCOM) has importuned the Indian government to set up a national Internet exchange. Currently, local Internet traffic goes through the US.

Figure 19: Estimated value of e-commerce in India



### 6.3 New Ways to Work

Figure 20: Estimated growth of telework in India



Telework may be another matter entirely. Although small in size proportionately, Indian information workers are well educated—and English-speaking—and the Indian software industry is growing rapidly, with total 1998 revenues exceeding 3.4 billion euros, according to NASSCOM, almost 10 percent of India’s GDP. Annual growth is expected at rates exceeding 50%. Software exports exceeded 2.5 billion euros in 1998, for a growth rate of 68%. A significant , but not well documented, fraction of that industry involves some form of telework since many Indian software developers work for organizations in the US and Europe.

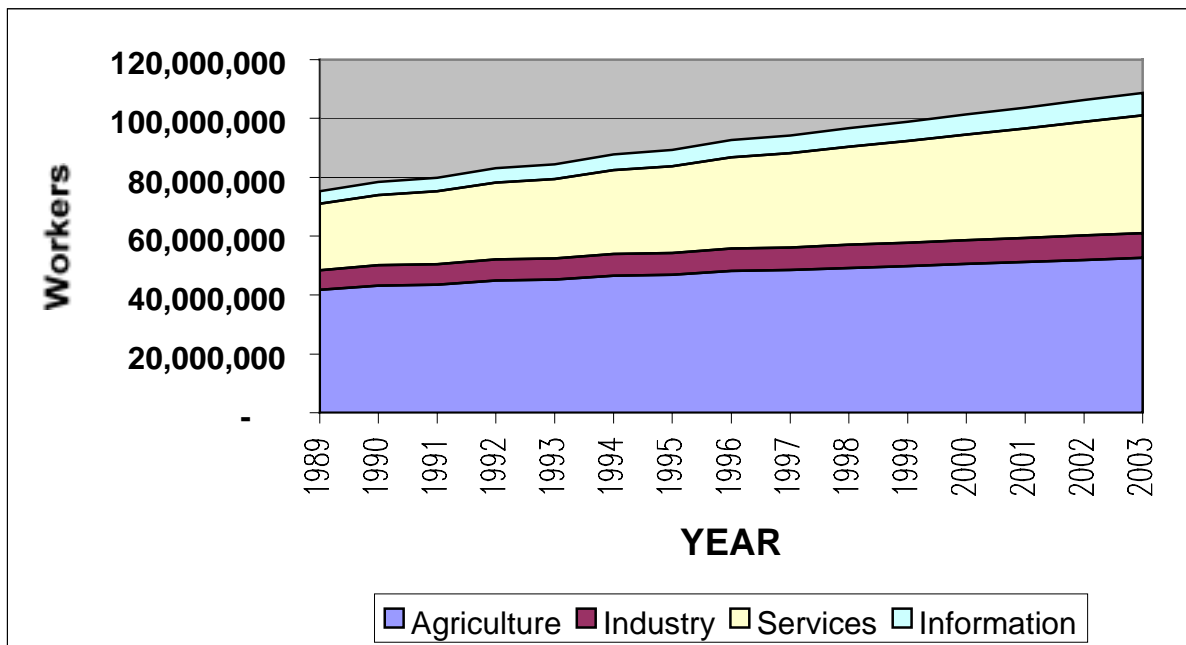
However, as far as we can determine, little telecommuting is occurring in India, even though large Indian cities are notoriously congested and there are no four-lane highways interconnecting major cities. When the cost and income factors are taken into account, the result is a wide spread between “nominal” rates of telework and the more likely cost-corrected values shown in Figure 20.

# 7 Indonesia

## 7.1 The economy

Indonesia is the world's fifth largest country, with a population of almost 204 million at the end of 1998. Like India, about 53% of Indonesia's workforce are in farming and other extractive industries. Only a small fraction of Indonesians are currently information workers, as shown in Figure 21, but both the information and other service sectors of the economy are growing. The figure does not fully reflect the past two years of economic turbulence in Indonesia, nor the potential changes in the economy that may result from its recovery and its turn toward more democratic government; these factors have yet to show up in available demographic and economic data.

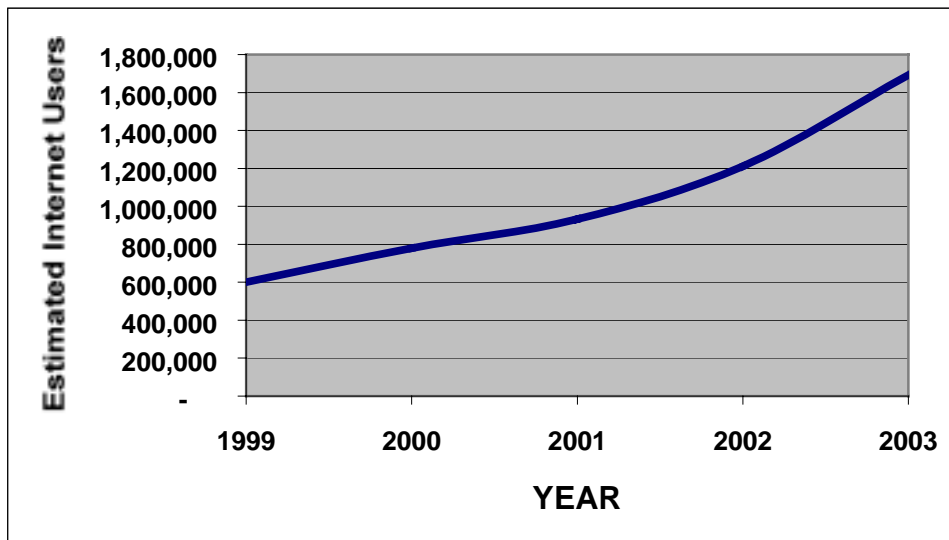
Figure 21: Estimated composition of the Indonesian workforce



Unlike some other developing countries, Indonesia's telecommunications industry is still government controlled. PT Telkom, the government-controlled monopoly, will keep its monopoly status until 2006. It will also retain exclusive rights to provide domestic calls until 2011. This should insure a relatively leisurely pace of expansion of Indonesia's telecommunications infrastructure at about 10% until competition is introduced.

Indonesia, although more than double India's per capita GNP at about 12.5% of the US value, still has a major uphill fight to have a high tech infrastructure available for the average citizen. Even though Indonesia has two communication satellites to cover its more than 13,000 islands, most of their use has been for military purposes. Therefore, most of e-world developments in Indonesia will accrue to the benefit of the wealthier fraction of the populace. This is reflected in the Internet access data and estimates shown in Figure 22. Since late 1997 there have been 23 ISPs in Indonesia, none of which has a large customer base.

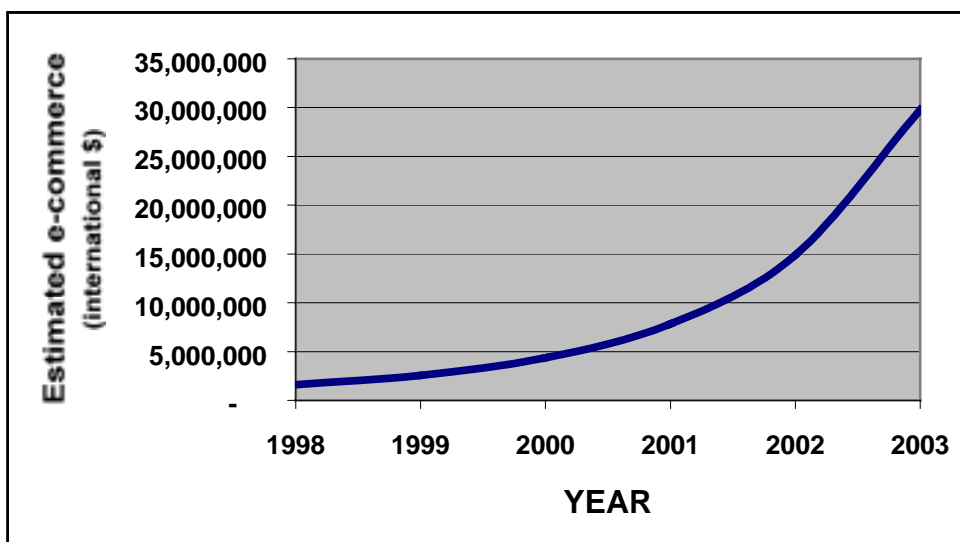
Figure 22: Estimated Internet users in Indonesia



## 7.2 E-commerce

There is very little evidence of e-commerce in Indonesia and it is not expected to develop in any substantial way until after the breakup of PT Telkom or the introduction of competition in the country. What e-commerce occurs is largely through sites in Singapore. Because of the dearth of data and the current uncertainties in Indonesia's government, our forecast in this area should be considered tentative. Figure 23 shows the results of the forecasting model.

Figure 23: Estimated e-commerce in Indonesia



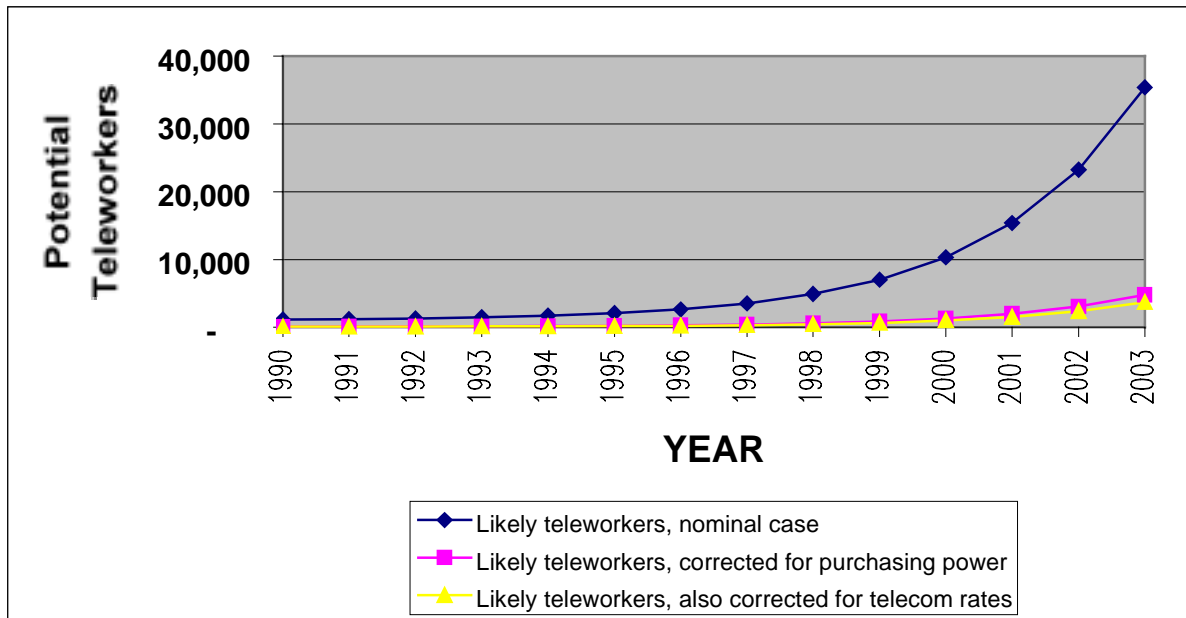
## 7.3 New Ways to Work

Slightly more effort has been made to develop telework in Indonesia, including government plans for a pilot project involving government employees in Jakarta. There is

also a certain amount of Internet-mediated telework on an international scale, but not of the magnitude seen

in India. The current estimate of Indonesian telework levels is shown in Figure 24.

Figure 24: Estimated growth of telework in Indonesia.



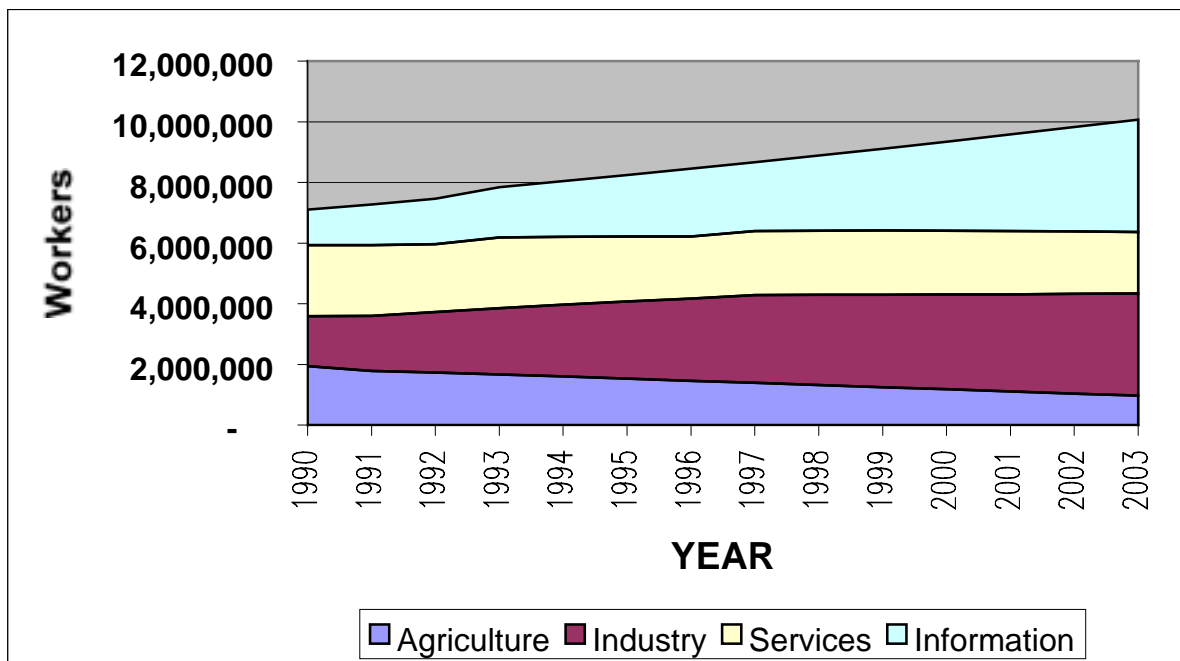
Also like India, there is a wide gap between the nominal potential for telework and the more likely actuals when corrections are made for Indonesia's economic troubles. As traffic congestion continues to worsen, the number of urban information workers increases, and the telecommunications infrastructure improves in cities such as Jakarta and Jogjakarta, the actual values may more closely approach the nominal potential curve. However, we know of no household or business survey data covering teleworkers in Indonesia.

# 8 Malaysia

## 8.1 The economy

Malaysia is one of the key “Asian Tigers” as a consequence of its energetic efforts to transform itself into an information age nation. Unlike its larger neighbors, Malaysia’s workforce is well under way on the road to becoming an information dominant economy, as shown in Figure 25. The information sector is estimated as constituting 28% of the workforce at the end of 1998; it is expected to grow to 38% of the workforce by the end of 2003. Malaysia’s GDP has had annual growth rates in the 7% to 9% range throughout the early to mid-1990s.

Figure 25: Estimated composition of the Malaysian workforce



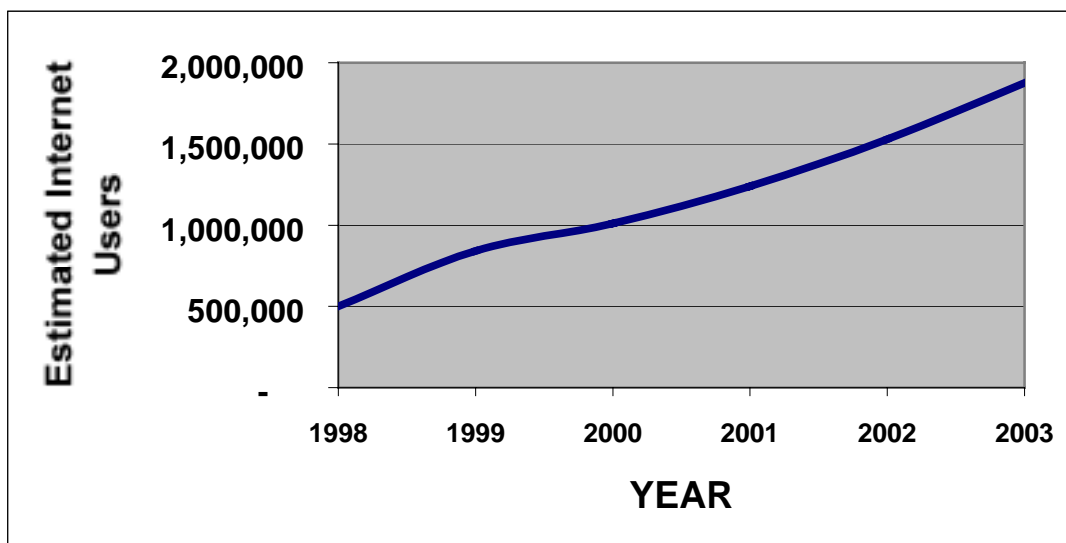
Malaysia is heavily involved in manufacturing electronic products and has as a national goal the development of its Multimedia Super Corridor (MSC) to attract leading edge technology companies in the information technology and multimedia industries as part of the government’s Vision 2020 master plan. Physically, the MSC is a corridor 15 km wide and 50 km long, starting at the Kuala Lumpur City Center and ending at the Kuala Lumpur International Airport. It includes the world’s tallest building, with plans for two “smart cities”. A variety of incentives are provided by the government to attract high tech companies to the MSC. The 20-year plan for the MSC is focused on a very high level of information infrastructure in order to serve both as a test bed and a demonstration site for new technologies. One of its stated goals is: “A world of Smart Homes, Smart Cities, Smart Schools, Smart Cards, and Smart Partnerships.”

Although Malaysia’s per capita GNP has almost tripled in the past decade, to an estimated 28% of that in the US by the end of 1999, it still presents some barriers to more rapid growth in the use of relatively expensive information technology. In mid-1999 a telephone

call to the United States was still almost 200 times the cost of a local call. However, Internet access calls are relatively modest, consisting of an annual fee of about 6 euros and per-minute connect charges of about 0.0025 euros. The current estimate of Internet use is shown in Figure 26.

The government telecommunications department that operated the telephone network was privatised in 1984, becoming Telekom Malaysia. However, the company remained a monopoly until 1 January 1999, when the Malaysian telecommunications industry was formally opened to competition. The results of the newly competitive environment should begin to become apparent within the next five years but little noticeable change is expected before yearend 2000.

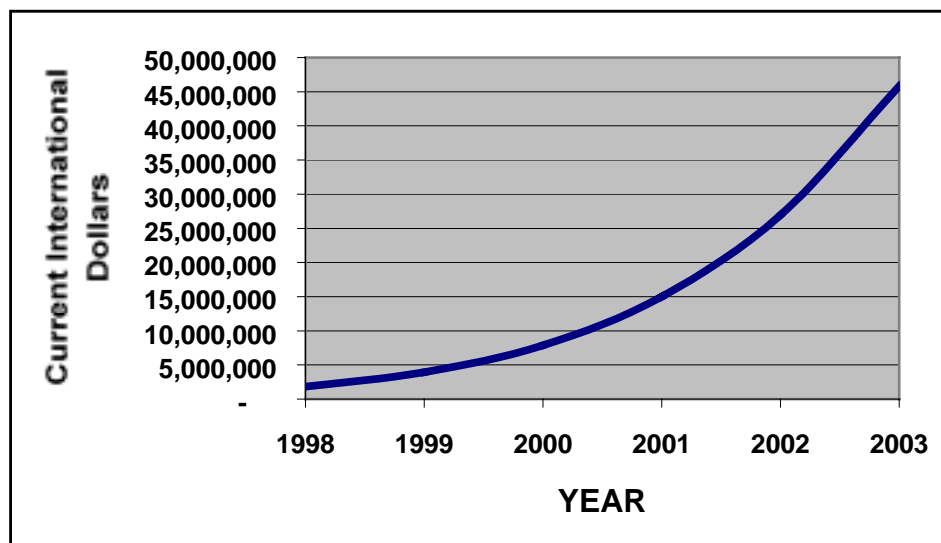
Figure 26: Estimated Internet use in Malaysia



## 8.2 E-commerce

There is a high level of interest in e-commerce in the Malaysian government and in its resident information industries. Beginning in 1997, the government established an Inter-Agency Task Force on Electronic Commerce to develop a national strategic action plan and recommend policy initiatives on security, encryption technologies, and transaction tracking mechanisms for facilitating e-commerce. One of the key topics for discussion was the relative advantages and disadvantages to Malaysia on e-commerce vis-à-vis international trade. So far, the conclusion appears to be that the advantages outweigh the disadvantages but that the country should proceed with caution.

Figure 27: Estimated growth of electronic commerce in Malaysia



There is very little in the way of hard data concerning the overall levels of e-commerce in Malaysia. Thus, Figure 27 represents the results of the current forecasting model. Similarly, there are no data concerning the apportionment of business-to-business and business-to-consumer e-commerce. Typically, business-to-business e-commerce represents 75% to 80% of the total volume.

### 8.3 New Ways to Work

Malaysia has also been involved in telework developments since the early- to mid-1990s. The earliest known<sup>3</sup> telework research in Malaysia was conducted by the Technical University in Johore Bahru as an implementation pilot project, beginning in 1995.

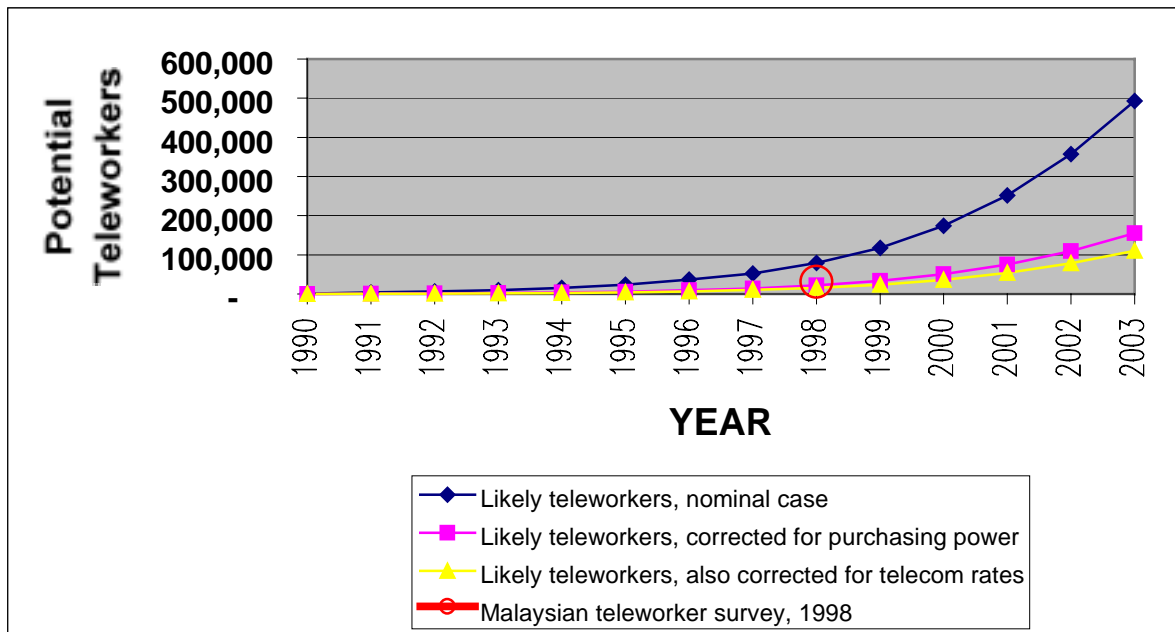
A survey of teleworking in Malaysia was carried out by Malaysia's United Institute for New Technologies, with funding from the United Nations Development Programme.<sup>4</sup> The study concluded that there were about 3.45 teleworkers per 1,000 workers in Malaysia in 1998, which translates to 30,660 for the country. The nominal estimate of the forecasting model for 1998 is 79,000 teleworkers if Malaysia were to match its potential without regard to economic issues. The model estimate, when corrected for purchasing power, is 22,000 teleworkers for Malaysia (see Figure 28). Hence, the reality depicted by the survey can be interpreted as an indication that most Malaysian teleworkers have above average incomes. The survey found that a substantial portion of the teleworkers surveyed were employed in routine data processing jobs and call center operations. Very little home-based teleworking was reported, most of it in manufacturing and the software industry. Teleworkers with professional or managerial level jobs constituted about 20% of the teleworkers.

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<sup>3</sup> To the author of this report.

<sup>4</sup> See [www.jaring.my/ksm/teleworking/default.htm](http://www.jaring.my/ksm/teleworking/default.htm)

Figure 28: Estimated number of Malaysian teleworkers



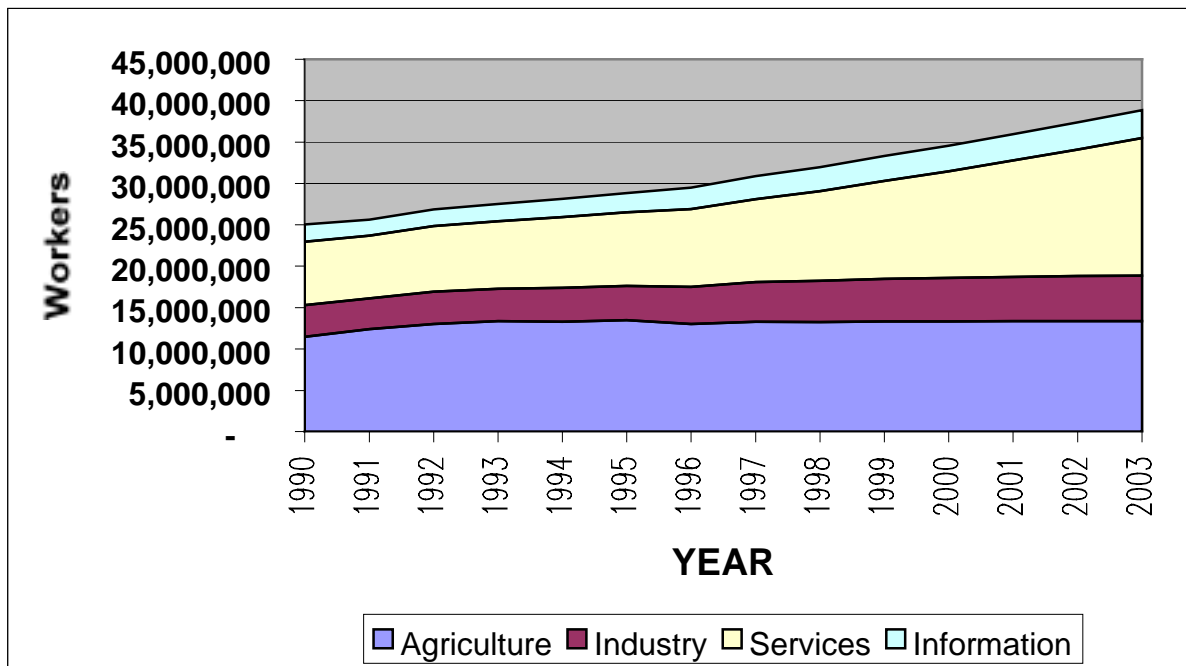
The incentives and barriers to teleworking reported by the survey were very similar to those mentioned elsewhere in the world: convenience and flexibility; greater productivity; and reduced travel time as major incentives, with setup costs; the need for face-to-face interaction; and management apprehension as the primary barriers.

# 9 Philippines

## 9.1 The economy

The Philippines is clearly in the transition stage from an agriculture-dominant economy to one that is more service and information intensive. Figure 29 shows the history and expected near future of its four-sector workforce.

Figure 29: Estimated composition of the Philippine workforce

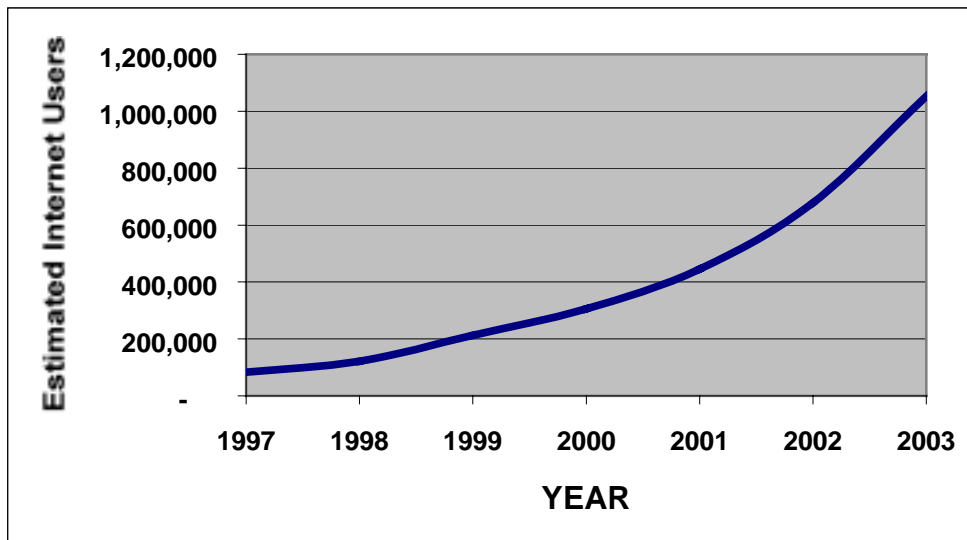


In 1992 the Philippines had one of the lowest levels of telephone penetration in Asia: slightly more than 1 per 100 inhabitants. By 1995 there were about 60 telephone companies, but most were operating only in urban areas and the long-distance traffic was controlled by a single company, the Philippine Long Distance Telephone Company. In 1995 a new telecommunications policy act was passed which, although still favoring the dominant carrier, acted to both deregulate telecommunications and increase coverage in more rural areas. One result was an increase in the number of phone lines to almost 4 per 100 inhabitants by the end of 1999. However, the cost of a phone call to the United States is more than 120 times the cost of a flat rate local call. In June 1999 the Philippine League for Democratic Telecommunications called for a boycott of both local and long distance telephone services to protest the high rates being charged and the threat of incipient call metering.

Still, interest in the Internet in the Philippines is growing. Although there are almost 100 Internet Service Providers in the Philippines, most of them have connections through backbones located in the United States. Internet dial-up connection charges are approximately 2 euros hourly (or 33 euros for up to 60 hours monthly). This fee is approximately 80% higher than similar charges in the United States. Since GNP per capita in the Philippines is only 12% of that in the United States, it is clear that access to the e-

world is currently limited to the wealthier citizens and companies. The current estimate of Internet usage in the Philippines is shown in Figure 30.

Figure 30: Estimated changes in Internet usage in the Philippines

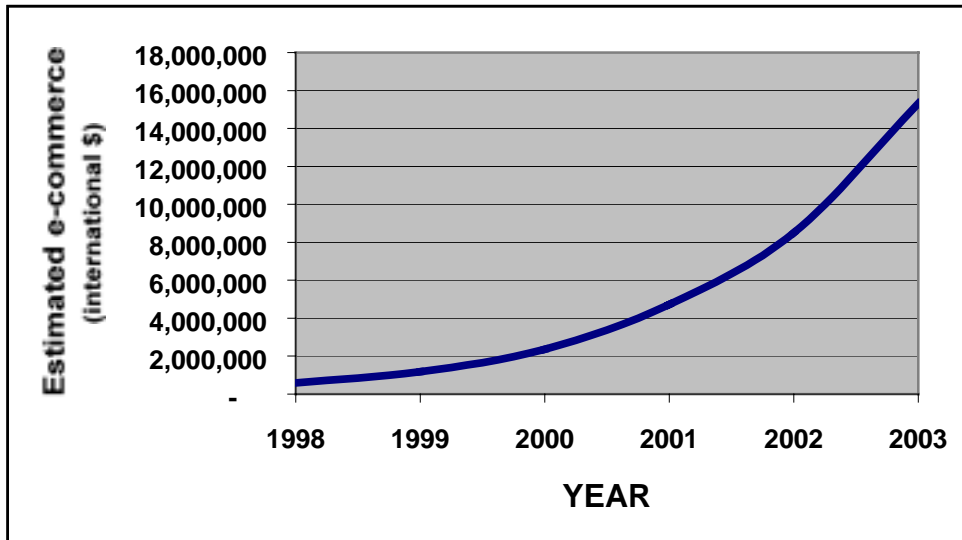


## 9.2 E-commerce

Several events in 1998 lead toward the development of electronic commerce in the Philippines. One was the creation of the Electronic Commerce Promotion Panel by then President Ramos. A variety of issues was addressed by the e-council, including changes in the laws to give legal status to electronic contracts, purchase orders and other e-documents necessary for effective electronic commerce; to develop standards for electronic transactions; and to work on marketing and promotion of e-commerce. Also some joint e-commerce ventures were begun between leading Philippine telecommunications providers and multinational corporations.

But the onset of e-commerce was just beginning in 1998 and no data are yet available as to the results. Hence, Figure 31 should be viewed solely as a preliminary estimate of the growth potential there.

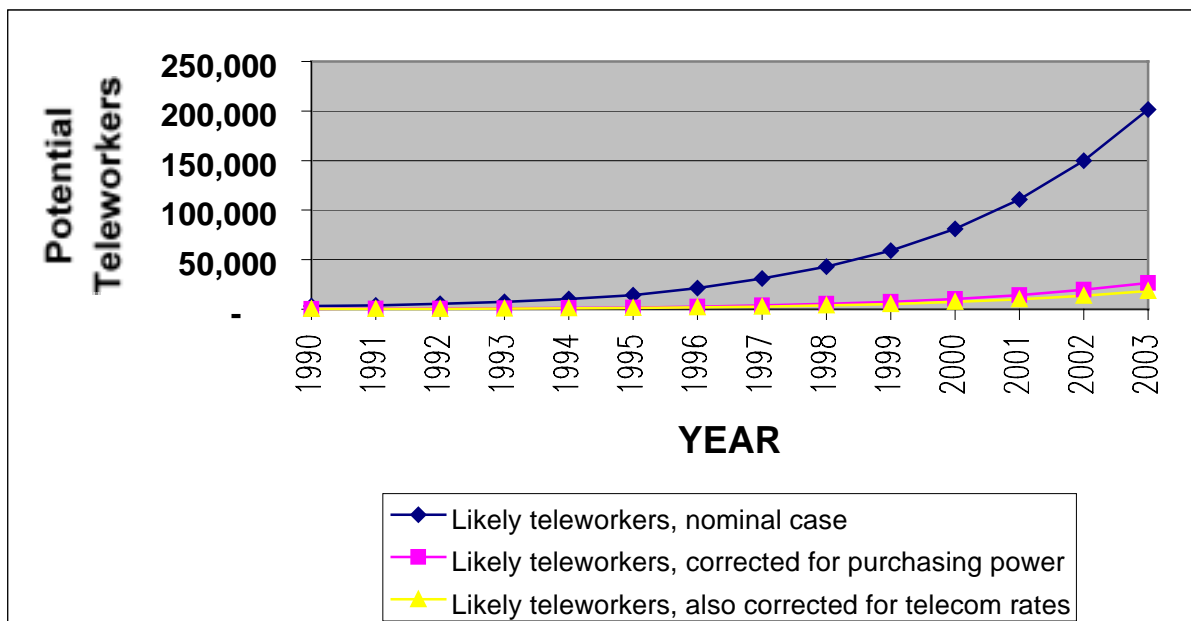
Figure 31: A very preliminary estimate of e-commerce in the Philippines



### 9.3 New Ways to Work

According to a 1992 study funded by the World Bank, the Philippines was the foremost country for producing remote data entry services, producing more than 100 billion keystrokes annually. The Philippines is still a center for such services but has also expanded in other forms of telework, including computer programming, as well. As the local telephone networks expand and improve—and as traffic in Manila and other major cities in the Philippines becomes even more congested—telecommuting will also grow in importance. The estimate for the rate of growth of telework is shown in Figure 32.

Figure 32: Estimated growth of telework in the Philippines



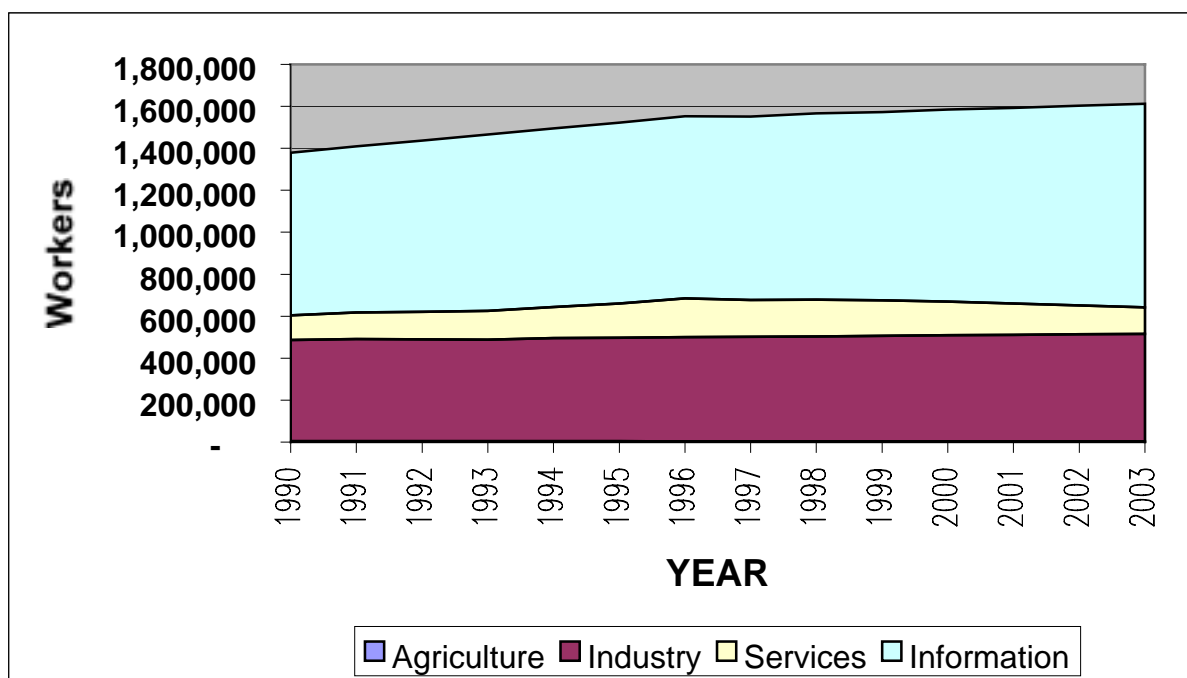
# 10 Singapore

## 10.1 The economy

Singapore is probably the most developed of the so-called developing countries. In fact it may be more developed than some of the so-called developed countries. As can be seen from Figure 33, the largest component (28%) of Singapore's workforce is in the information sector. Information technology production constitutes a major portion of Singapore's export income and the country has long had the ambition of being the telecommunications hub of Southeast Asia.

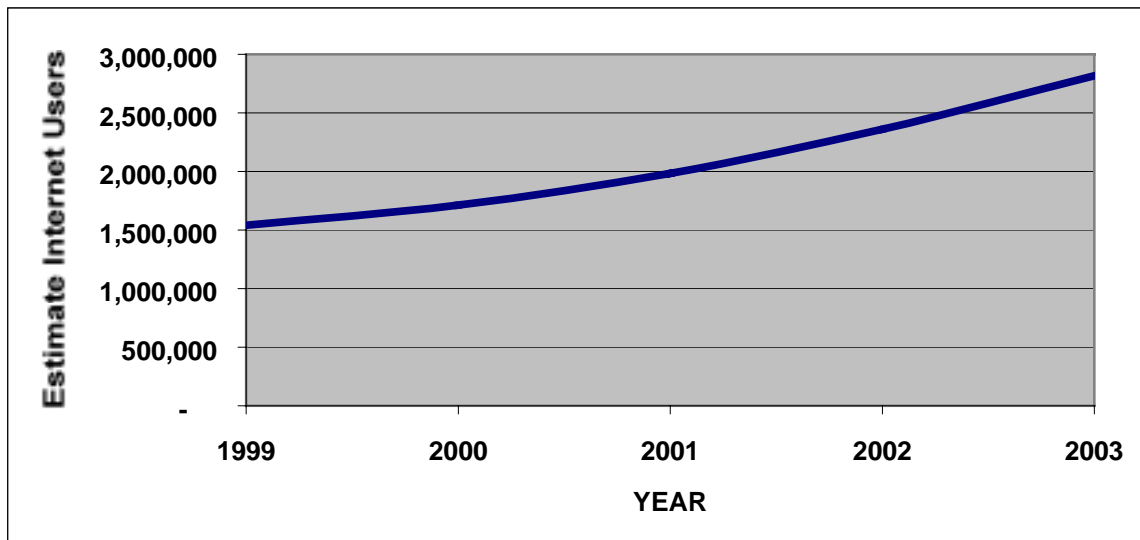
Singapore's Ministry of Telecommunications and Information Technology, a government agency, controls all the telecommunications services in Singapore via the Telecommunications Authority of Singapore (TAS). The TAS will be merged with the National Computer Board by the end of 1999, as evidence of the government's realization that digital communications are the core of future development. Singapore Telecom, Ltd. is the primary provider of telephone services on the island. Singapore is already very "wired" with 85 telephone lines for every 100 inhabitants. Internet access and usage is high and several of Southeast Asia's larger ISPs have headquarters in the country. Singaporeans also enjoy a high standard of living, with a per capita GNP approximately 9 percent higher than that of the United States in 1999. The cost of a telephone call to the US is about 75 times the cost of a local call but is one of the lowest costs in Southeast Asia. Two-channel residential ISDN access costs are 5.6 euros per month plus 0.008 euros per channel-minute during peak hours. For 56 euros monthly—plus phone charges, web surfers can have unlimited Internet access.

Figure 33: Estimated composition of the workforce in Singapore



The estimated use of the Internet is shown in Figure 34. In 1999 half the population had Internet access.

Figure 34: Estimated Internet usage in Singapore



## 10.2 E-commerce

Given Singapore's important role in the manufacture of information technology products, combined with the high level of telecommunications penetration, it is not surprising if Singapore were to be an active player in the development of e-commerce. In August 1996 the Electronic Commerce Hotbed Programme was introduced to serve as a focus for identifying the key issues of implementation and growth.

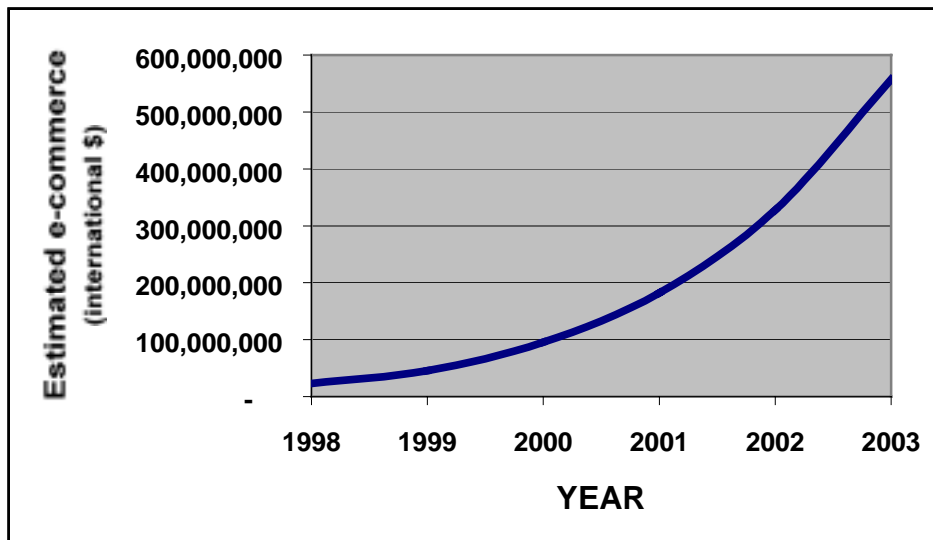
The Electronic Transactions Act of 1998 came into force in July 1998 as part of the Singapore government's commitment to e-commerce. The act provides a legal foundation for electronic transactions and is intended to give predictability and certainty to electronic formation of contracts. The government also launched its Electronic Commerce Plan "to drive the pervasive use of electronic commerce in Singapore, and to strengthen Singapore's position as an international e-commerce hub." The plan has five main thrusts:

1. To develop an internationally linked e-commerce infrastructure
2. To jump-start Singapore as an e-commerce hub
3. To encourage businesses to use e-commerce strategically
4. To promote usage of e-commerce by the public and businesses, and
5. To harmonize cross-border e-commerce laws and policies

Goals are to have a critical base of e-commerce services and a reliable infrastructure by 2000, and to have a sizeable amount of e-commerce transactions, an e-commerce services sector, and the widespread adoption of e-commerce by the industry by 2003.

In 1998 the National Computer Board polled more than 1000 companies, from small to large, and covering eight industry sectors, on e-commerce. Almost three-quarters (73.3%) of the companies surveyed had corporate Internet access and one-third had their own web sites. Our estimate of the growth of e-commerce in Singapore is shown in Figure 35.

Figure 35: Electronic commerce in Singapore



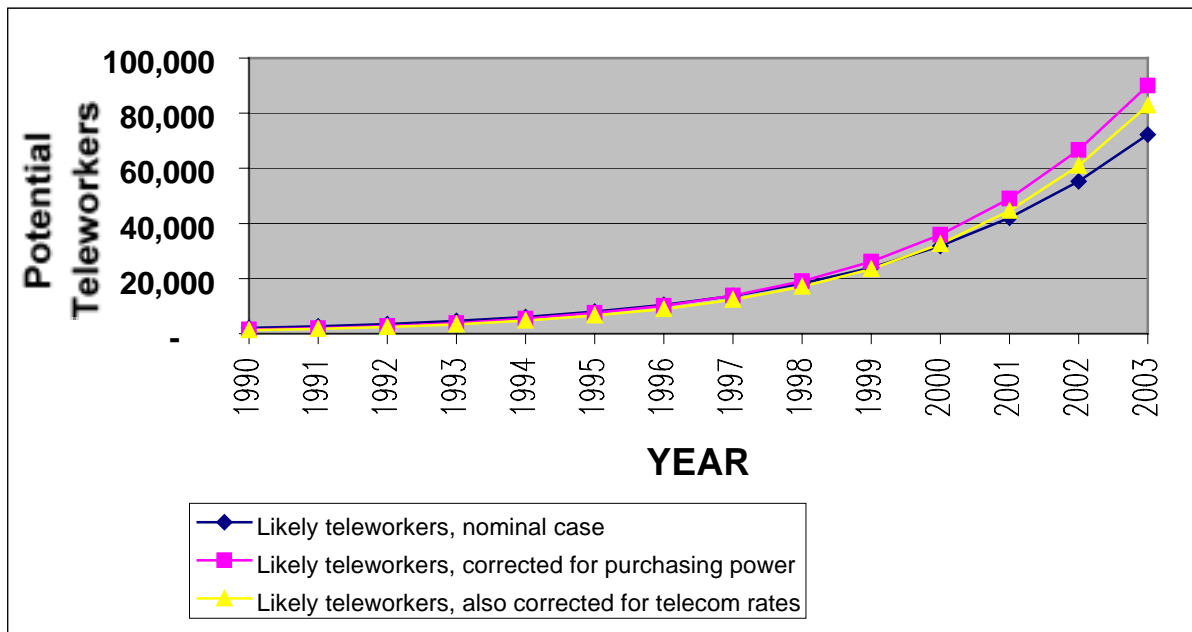
### 10.3 New Ways to Work

Singapore has necessarily been involved in telework since the early 1990s, if for no other reason than the fact that the island consistently has had negative unemployment rates: more jobs available than skilled people to fill them. For example, Singapore newspapers, including the *Straits Times*, are partially edited and designed in satellite offices in Sydney and Manila. Much of the domestic computer industry uses designers and other information support personnel from several other countries. Of course, Singapore also hosts subsidiaries of multinational firms, with manufacturing in Singapore and design in the host country.

As Singapore continues to pursue its path of high tech development, this pattern of multinational team development via telework is likely to grow and intensify. Figure 36 shows the current estimate of telework development in Singapore, although no survey data are available to verify the numbers. Curiously, the purchasing power parity corrections show higher levels of telework than the nominal case because of Singapore's higher per capita GNP. In any case, only the relatively small population of Singapore prevents it from being a world leader in numbers of teleworkers.

A 1998 Symantec survey of teleworkers in the Asia-Pacific region indicated that 83% of Singaporean teleworkers were part-time telecommuters and were mostly in managerial and professional jobs. The 14% of mobile teleworkers were primarily in sales or customer service jobs, and the 3% who telework full-time from home included a high proportion of female, self employed, customer service/support professionals. Unlike the United States, where telework is about evenly split among the genders, most of the teleworkers were male, except those working full-time.

Figure 36: Estimated growth of telework in Singapore



# 11 Thailand

## 11.1 The economy

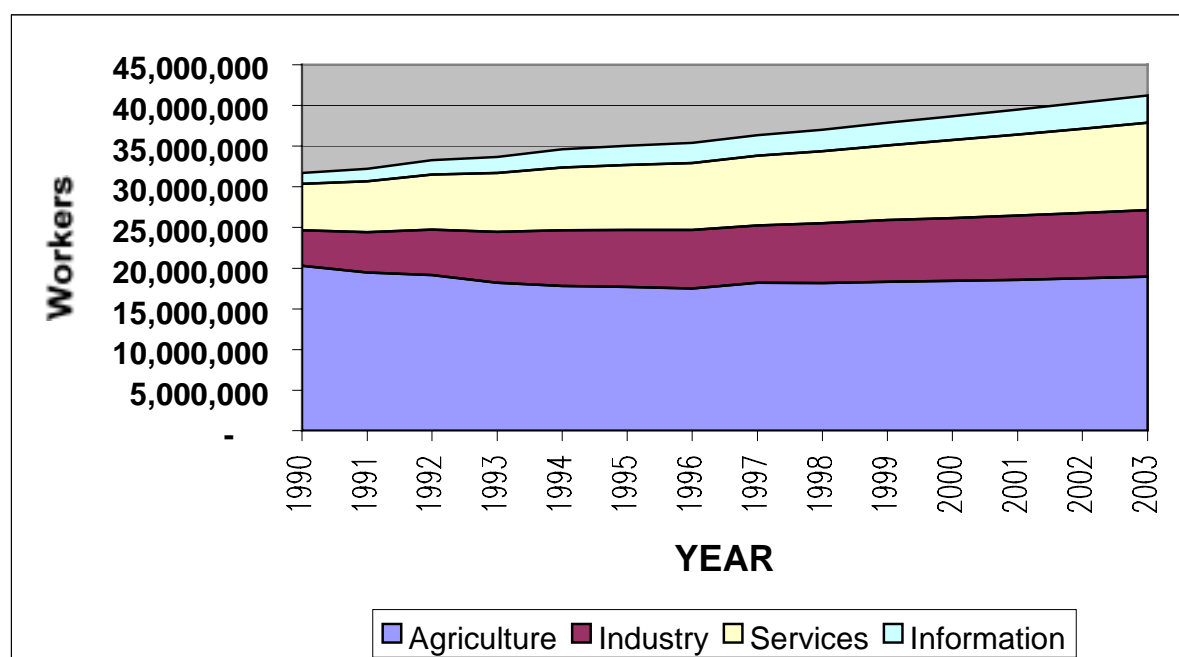
Thailand is still a largely agricultural economy, with 48% of the workforce farming. But the agricultural component of the workforce is declining steadily and the service and information sectors are expanding, as is shown in Figure 37. GNP per capita is 22% of that of the United States.

Thailand's information infrastructure historically has been controlled by the government under two organizations: the Telephone Organization of Thailand (TOT) for local traffic and the Communications Authority of Thailand (CAT) for long distance service. As part of Thailand's agreement with the World Trade Organization, both of these organizations are to be transformed into non-monopolistic telecommunication operators, beginning in 2000, like the "concessioned companies" that have been operating under their control. In 1999 a long distance phone call to the United States was about 59 times the cost of a local call.

As one consequence of the economic crisis beginning in 1997, Thailand has instituted a number of reforms that focus on development of its information economy, elaborated in its IT-2000 plan. The plan comprises three main components:

1. Better telecommunications infrastructure, including deregulation.
2. Improved human resource development and education, including development of its software industry.
3. Good governance, including elimination of corruption and development of better IT services to the public.

Figure 37: Estimated composition of the workforce in Thailand



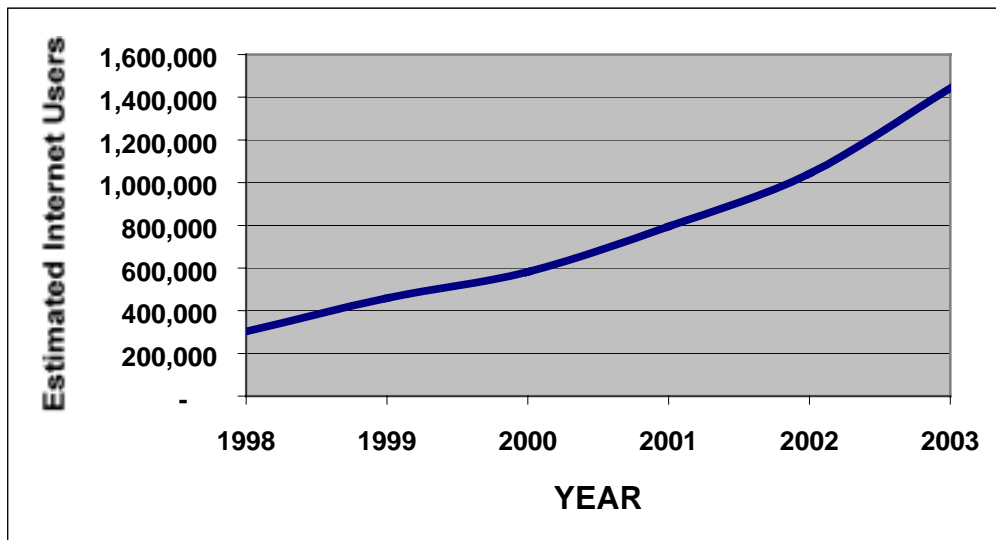
Thailand's first Internet use was in 1991. In 1992 the Thai Social/Scientific, Academic and Research Network (ThaiSam) was founded. As of 1999, ThaiSam had about 100 connections to all of the state-owned university sites. In 1995, ThaiSam extended its service to secondary schools. This was expanded in 1998 to allow schools to access the Internet without incurring expensive long distance charges.

Also in 1998 the National Information Technology Committee (NITC) empowered six subcommittees to draft information technology-related laws. These are:

1. Data Protection Law to protect privacy rights;
2. Computer Crime/Computer-related Crime Law to criminalize computer-related offenses;
3. Electronic Data Interchange Law to set the legal framework for electronic contracts;
4. Digital Signature Law to provide electronic commerce transaction security;
5. Electronic Funds Transfer Law to promote consumer protection and allocate liability; and
6. Universal Access Law to promote universal access to the National Information Infrastructure.

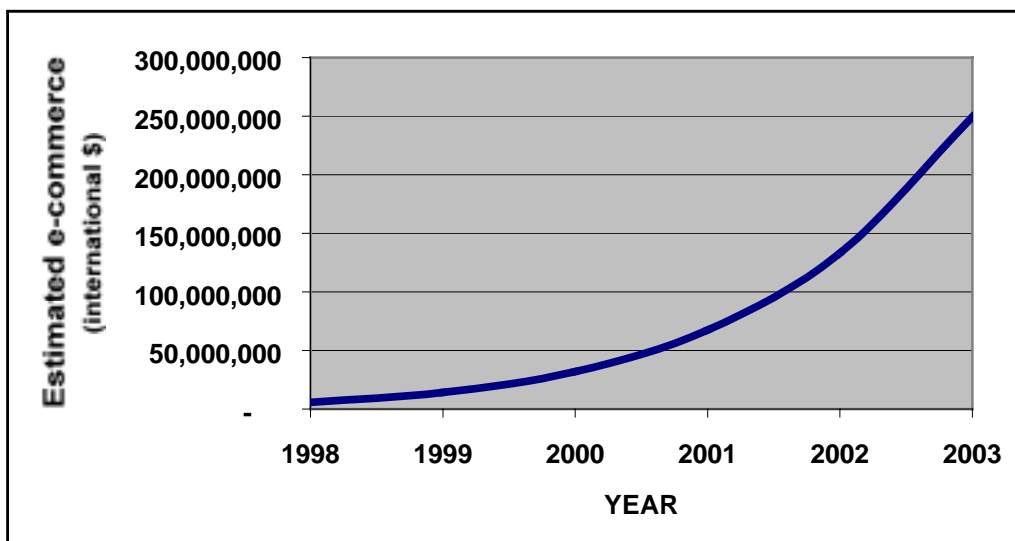
As a result of all of these initiatives, foreign investment in the telecommunications industry has been expanding and the new telecommunications regulations allow up to 40% foreign ownership of ISPs in 2000, expanding to 75% by 2006. Official registration, but no license, is required for opening a web site or online information service. In 1999 a typical monthly charge for a dialup Internet service in Bangkok was about 30 euros for 50 hours. The estimated growth of Internet usage in Thailand is shown in Figure 38.

Figure 38: Estimated growth of Internet usage in Thailand



## 11.2 E-commerce

Figure 39: Estimated growth of electronic commerce in Thailand



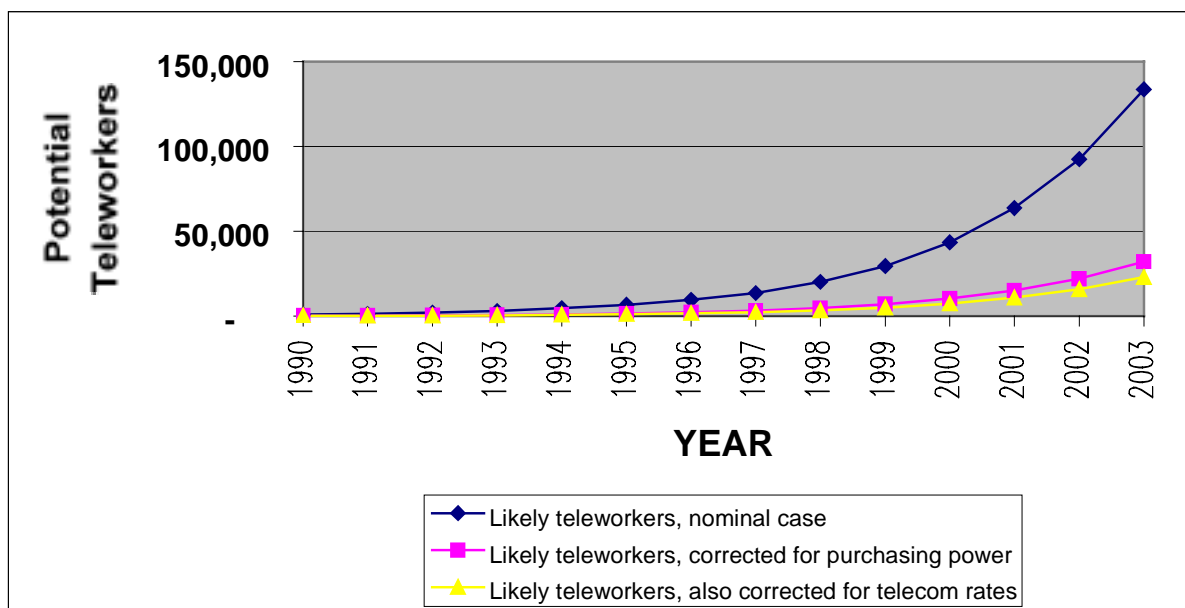
The development of electronic commerce is one of the keystones of Thailand's IT-2000 plan. In January 1999 the government approved a proposal to set up an Electronic Commerce Resource Center to provide e-commerce-related information and training programs, particularly to SMEs. One goal of the center is to prepare SMEs to compete internationally via e-commerce—as well as to defend themselves against competition from outside the country. The activities of the center are part of the APEC (Asia Pacific Economic Cooperation organization) Virtual E-commerce Resource Network. Related initiatives include a smart card development program, a center to provide EDI services between government agencies and the private sector, and a one-stop trading service to smooth the procedural processes for the export trade.

Even though the coordinated government efforts just began in 1999, there have been some e-commerce operations prior to that as various entrepreneurs began online and Internet-based operation. These are expected to accelerate as the government initiatives come to fruition—particularly those efforts involving transaction security. Our estimates of the growth of e-commerce in Thailand are given in Figure 39.

### 11.3 New Ways to Work

The evils of traffic congestion in Bangkok are becoming well known around the world, with stories of multi-hour trips just to get from one side of the city to another. Air pollution is also becoming a deterrent to tourism and business development in general in and around Bangkok. As yet there is no concerted government effort to promote telecommuting or other forms of telework, nor are there any available survey data of the level of teleworking in Thailand. Nevertheless, teleworking is expected to increase, particularly as the information sector of the economy continues to grow and the telephone network expands from its 1999 level of 10.4 telephone lines per 100 inhabitants. Our estimate of the growth of teleworking in Thailand is shown in Figure 40. Note that the potential for telework in Thailand by 2003 is significantly higher than our economy-corrected forecast.

Figure 40: Estimated growth of telework in Thailand.



## 12 Summary and Conclusions

The key elements of the 10-country survey are contained in Tables 1 through 3. They include the figures from the main report for comparison.

*Table 1: Summary of Internet user estimates (millions)*

Country	1998	1999	2000	2001	2002	2003
Argentina	0.230	0.313	0.486	0.755	1.173	1.822
Australia	4.900	7.517	8.603	9.869	11.274	12.652
Brazil	2.208	2.674	2.967	3.631	4.221	5.155
China	2.100	3.174	3.963	5.548	6.888	8.937
India	0.600	1.500	1.500	2.519	3.374	4.849
Indonesia	0.360	0.600	0.779	0.933	1.211	1.692
Malaysia	0.500	0.841	1.012	1.240	1.529	1.875
Philippines	0.121	0.213	0.306	0.445	0.678	1.052
Singapore	1.329	1.541	1.712	1.984	2.359	2.817
Thailand	0.302	0.459	0.582	0.794	1.043	1.443
United States	87.517	101.000	115.202	124.430	132.240	137.919

*Table 2: Summary of e-commerce volume estimates (USDmillions)*

Country	1998	1999	2000	2001	2002	2003
Argentina	25	62	163	433	1147	3040
Australia	218	574	1511	3975	10458	27510
Brazil	0	271	718	1904	5047	13376
China	0	10	20	36	81	186
India	8	21	160	400	920	2024
Indonesia	2	3	4	8	15	30
Malaysia	7	15	30	57	102	174
Philippines	1	1	2	5	9	15
Singapore	23	46	96	182	328	557

Thailand	6	14	32	67	133	249
United States	70900	144863	317458	620432	1050174	1658800

The following are the conclusions reached during the preparation of this report supplement.

- With the exception of Australia, most of the countries are either in the initial stages of e-commerce development or are just beginning planning such ventures at the federal level. Substantive results are not expected until 2003 or later, with Australia and Brazil most likely to be in the lead. Large countries such as China and India have high long-term potential for both e-commerce and telework, but it is not likely to reach significant international impact for at least a decade.

*Table 3: Summary of telework estimates (millions)*

Country	1998	1999	2000	2001	2002	2003
Argentina	0.210	0.269	0.340	0.429	0.535	0.655
Australia	0.353	0.431	0.522	0.627	0.749	0.892
Brazil	0.013	0.019	0.029	0.045	0.069	0.104
China	0.001	0.002	0.003	0.005	0.008	0.012
India	0.027	0.039	0.058	0.084	0.121	0.173
Indonesia	0.001	0.001	0.001	0.002	0.003	0.005
Malaysia	0.022	0.033	0.051	0.075	0.109	0.155
Philippines	0.005	0.008	0.010	0.014	0.020	0.026
Singapore	0.019	0.026	0.036	0.049	0.067	0.090
Thailand	0.005	0.007	0.010	0.015	0.022	0.032
United States	18.643	21.408	23.815	25.862	27.563	28.992

- A primary impediment to the development of business-to-consumer e-commerce and, to a lesser extent, business-to-business e-commerce, is the lack of a reliable and dependable online transaction system. This includes low use/acceptance of credit/debit cards.
- Most of the developing countries have yet to attain the information infrastructure necessary for efficient e-commerce or telework. Telephone penetration is low and telecommunications prices are excessive when compared to consumer/business purchasing power.

- Language barriers constitute a problem in two respects: in non-English-speaking countries, there is often little online content in indigenous languages; and in some cases there are many indigenous languages and low literacy rates, further reducing both effectiveness of, and demand for, access to the Internet.
- The proportion of information workers in each country's workforce is roughly proportional to its per capita GNP; the higher the per capita GNP, the larger the fraction of information workers. Conversely, the lower the per capita GNP, the later the country is expected to have high proportions of either e-commerce or telework.
- There are teleworkers in all of the countries surveyed but most of the countries have no telework policy or plans for support of demonstration projects. The exceptions are Australia, Malaysia and Singapore.