Cybertax

C Y B E R T A X*

After Faraday discovered the basic principle of electromagnetic induction in 1831, a sceptical politician asked him what this was good for. Faraday responded: “Sir, I do not know what it is good for. However, of one thing I am quite certain, some day you will tax it.”

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Internet, the fastest growing communications medium or consumer electronic technology, doubles its size every six months. Within a few years the number of citizens in Cyberspace will outnumber all but the largest nations. The borderless world of the Internet extends its reach to all corners of the world. Best of all, it is almost free. Hardware costs aside, once on the Internet a user can surf anywhere for the price of a local phone call. But what about all the foregone tax revenue that electronic commerce could facilitate? Although Internet commerce is in its earliest stages, its rapid growth is anticipated. Some estimate that in thirty years time, consumer activity online could represent more than thirty percent of total consumer activity. This leads to the erosion of national tax bases. In this paper we show that as a measure of last resort the bit tax can be implemented. Although the exact implementation of such a tax is not yet clear, the general idea of a tax on information from the point of view of an eroding tax base and the changing society is certainly worth considering. Furthermore, the tax revenues could be directed towards improving access to the Internet, educating individuals to become acquainted with the Internet and providing additional needed bandwidth.

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Introduction

The emerging Information Society (IS), characterised by rapid change and high degrees of flexibility, will require considerable adjustments by workers, firms, and governments.[1] Growth in productivity, output and jobs must be built on a comprehensive foundation of technological progress and the development of human capital. Coherent policies must therefore create incentives for expanded investment in human capital, technology, innovation and information networks. Government policies must nurture this society and promote the adjustment towards the new era of the IS.[2] To achieve this formidable goal, policies must create an environment in which each individual is provided with the skills and tools to participate in this new society.[3] In their report "Global Information Infrastructure -- Global Information Society (GII-GIS): Policy Requirements" the Committee for Information, Computer and Communications Policy recognises these radical changes when they state:

> *"Industrial economies are at the threshold of potentially radical structural changes in their economic structures. Communication networks and interactive multimedia applications are providing the foundation for the transformation of existing social and economic relationships into an "information society". Such an information society is viewed as resulting in a paradigm shift in industrial structures and social relations, much as the industrial revolution transformed the then agrarian societies ... The development of an information society is expected to have important beneficial impacts on economies and society; it is expected to stimulate economic growth and productivity, create new economic activities and jobs. Unlike other technological changes, the rapid developments and diffusion*

> *of communication and information technologies and the emergence of interactive multimedia applications have the potential to affect all economic sectors, organisational and work structures, public services, cultural and social activities."* (p. 5)

In the rapid evolution towards an IS the telecommunications market plays an important and decisive role by selling and creating the means to communicate, *i.e.* bandwidth. In this rapidly growing market bandwidth is usually sold on a timed basis - calls are billed based on the length of the call - while many leased lines and data lines are sold at a fixed price. However, while bandwidth capacity is increasing dramatically, it is highly doubtful that capacity growth can keep up with demand growth. The number of people who have acquired an Internet connection is doubling every year, while bandwidth is certainly not.[4] In other words, key resources are and will remain scarce for the next twenty years. The most serious question will be how to allocate the scarce resources of the Internet.

Economics is the study of resource allocation problems. The standard economic answer in this regard is to create markets and let prices allocate the scarce resources. However, the economic answer with respect to the Internet is not as straightforward as many economists might think. Currently, information is provided to the Internet user at a fixed price, regardless of the value of that information to particular users. If the information value is high to the consumer, *e.g.* downloading the Dutch Central Bureau of Statistics' online database for a project at work, the same is amount is paid as acquiring information for entertainment purposes, *e.g.* downloading pictures of Pamela Anderson. This point alludes to the difficulties and challenges associated with pricing information downloaded from the Internet. Several authors have addressed the problem

of how to appropriately price the Internet.[5] At this stage, however, their models remain highly theoretical and their recommendations cannot be implemented either because of lack of knowledge and skills on the side of scientists or because of an unwillingness on the side of 'popular' politicians. The real answer to the problem of Internet pricing might come from the Internet Service Providers (ISPs) and the financial world.[6]

In Europe, the High Level Expert Group on the Social Aspects of the Information Society (HLEG) has called for reflection and research on alternative taxation systems. One feasible approach they suggest is a bit tax. Such a tax may be a tool for governments to consider in an increasingly information-based world in which value is generated through systems and global networks, instead of through clearly identifiable material production and exchange, *i.e.* intangibles versus tangibles.[7] Soete and Kamp (1996) and (1997a) elaborate further on the idea suggesting research and an improved understanding of the taxation issues related to electronic commerce.[8]

This paper discusses the case of taxing cyberspace and develops the case in favour of a tax on electronic commerce. We proceed in the following manner. In *Section 2* we sketch a picture of consumer behaviour towards the IS in general and the Internet in particular by discussing the *ex ante* conditions consumers demand in order to enter the IS and/ or the Internet. First, we deal with buying decisions and show that Europeans have a comparative disadvantage compared to US consumers. Then, we investigate access issues to show the 'IS literacy' of the population and tax implications. Thereafter, in *Section 3*, we explain the philosophy behind taxing electronic commerce. Then, we construct a business model to illustrate how the various players profit from the Internet. In assessing and collecting tax from transactions on the Internet this is an important

exercise. This business model is useful in showing different monetary flows that occur when a consumer purchases a product from the Internet. Hence, by using this model we can identify the taxing possibilities; we propose three different ways to tax electronic commerce. We end with some concluding remarks.

Accessing the information society

Buying decision

One argument in opposing taxing the IS is the (further) creation of a two-tier society.[9] Once information is priced it will become hard for individuals without an Internet connection to obtain one. In other words, by taxing the Internet we could create information 'haves' and 'have nots'. In order to see whether this argument is valid we look at the buying decisions of individuals with regard to a new product and we investigate the number of Internet users and their behaviour by presenting figures on the number of users and the number of hosts.

The central issue with regard to access to the Internet is: what are the factors that determine the use and or purchase of this innovative good? First, we need to define the buying decision. Is it the decision of a 'computer-less' individual to buy a Personal Computer (PC) with an Internet connection or is it the decision of an individual who already has a computer to buy a modem in order to obtain an Internet connection? To see the validity of this question we introduce *Table 2.1*. This table shows the number PCS and the number of Compact Disc - Read Only Memory (CD-ROM) players in the European Union.[10] From *Table 2.1* we observe that the number of PCS is by approximation twice as large as the number of CD-ROM players in Belgium, Germany and the Netherlands and that it exceeds this ratio by far in the other EU-countries. Looking at the number of households with a PC, we observe that in Denmark, the Netherlands and Sweden approximately 25 percent of households have a PC. In Belgium, France, Greece and Italy the rates are 15, 15, 10 and 14 percent, respectively. If we compare these findings with the percentage of households with a CD-ROM player we observe that matters become worse. Under the assumption that the number of CD-ROM players equals the number of modems, only a

percentage of less than 10 of the EU population is ‘Internet literate’. Thus, currently the percentage of ‘have nots’ in the EU is approximately 90% of the all households.

Table 2.1: Number of PCS and CD-ROM players in the European Union, 01/01/1996

Country	Number of PCS	Households with a PC (%)	Number of CD-ROM Players	Households with a CD-ROM Player (%)
Belgium	585.000	15	273.000	7
Denmark	720.000	24	270.000	9
France	3.300.000	15	1.320.000	6
Germany	4.940.000	19	2.860.000	11
Greece	350.000	10	105.000	3
Italy	2.800.000	14	1.200.000	6
Netherlands	1.525.000	25	610.000	10
Spain	2.415.000	21	805.000	7
Sweden	945.000	27	315.000	9
UK	4.400.000	20	1.540.000	7
Total EU-10	21.980.000	19	9.298.000	8

Source: RIPE (1997)

What determines the buying decision of an individual? Five factors can be identified that play a role in the minds of potential purchasers of innovative goods. These factors are: comparative advantage, complexity, compatibility, diffusion and communication.[11] With respect to comparative advantage, an individual examines whether a PC with an Internet connection provides any added value. Currently, newspapers, television and radio are the most used media to collect information from. People are acquainted with these media and are satisfied with their performance and many are not willing to adapt to use the Internet. In addition, the fees charged by ISPs are for many a barrier to access the Internet. *Table 2.2* shows the ranking of ISP charges in US$PPP in 1995. From this table we observe that the cost of accessing the Internet are the lowest in Australia, the UK, the US, New Zealand, Canada, Finland and the Netherlands, both in nominal terms and as a percentage of GDP per capita. It is not surprising that the more

developed countries charge the least, since their electronic infrastructure is best developed. In terms of GDP per capita, Mexico and Turkey are the worst off on this measure with an Internet connection costing over 1 percent of their GDP per capita. Surprisingly, EU countries such as Germany, Italy, Belgium and Denmark also charge high prices for an Internet connection.

Table 2.2: Ranking Internet Access Provider Charges (Dial-Up), 1995

Country	20 Hours per Month US$PPP	30 Hours per Month US$PPP	Average Charge US$PPP	Average Charge/GDP per Capita US$PPP
Australia	10.45	16.54	13.49	0.071
UK	14.67	14.67	14.67	0.075
New Zealand	15.26	15.26	15.26	0.093
Finland	18.85	18.85	18.85	0.106
USA	20.64	20.64	20.64	0.077
Netherlands	21.13	21.13	21.13	0.106
Canada	15.96	27.96	21.96	0.104
Iceland	24.35	24.35	24.35	0.119
Sweden	25.10	25.10	25.10	0.135
Spain	35.10	35.10	35.10	0.242
Norway	35.69	53.07	44.38	0.202
Switzerland	46.95	55.95	51.45	0.199
Portugal	42.25	67.25	54.75	0.432
Austria	59.32	59.32	59.32	0.279
Japan	53.04	86.19	69.61	0.315
France	61.37	91.39	76.38	0.363
Greece	77.39	77.39	77.39	0.661
Mexico	80.41	80.41	80.41	1.256
Denmark	67.48	99.64	83.56	0.394
Turkey	72.97	117.97	95.47	1.711
Italy	79.08	117.82	98.45	0.495
Belgium	108.36	108.36	108.36	0.500
Germany	118.06	162.09	135.08	0.673
Ireland	153.49	153.49	153.49	0.979
Luxembourg	154.65	154.65	154.65	0.414
OECD	67.35	83.94	75.65	0.400

Source: Sanz and Salvador (1997), Worldbank (1997)

Most individuals find it still too complicated to use a PC. This leads us to the second factor: complexity. An individual asks himself whether he can become easily acquainted with a PC and

the Internet. Unfortunately, the answer to this question is in almost all cases certainly negative. A PC is for most individuals a very complicated 'thing' to deal with, let alone the Internet which makes intensive use of an individual's computer skills. This leads us to the third factor: compatibility. Hereby we mean the extent to which the Internet fits into an individual's personal life. At this stage it seems safe to conclude that most individuals are not yet part of the IS. This is due to the high costs involved in purchasing a PC with a possible Internet connection, a so-called Multimedia PC. This brings us to our fourth factor, the factor of diffusion. People can only become acquainted with the Internet if they can buy a Multimedia PC easily. This is currently not the case since such a computer is relatively expensive and costs over two thousand US Dollars.

Finally, we turn our attention to the factor of communication. This is perhaps the most important one, because it makes individuals aware of the greater utility associated with using the Internet.[12] This may sound logical, but history has proven that many high-tech goods failed because of lack of communication with the potential customers - potential customers were unaware of the innovative qualities of the product - and because of a lack of skills by consumers. This is an essential point in the further growth of the Internet in particular and the IS in general, and gives governments an opportunity to carry out their educational programmes focussing on computer skills on the one hand and the efficient gathering of information on the other. However, it is crucial to acknowledge that in the emerging IS the learning process does not take place at school or work only. Learning through consumption might be one of the most important ways to become familiar with the Internet.[13]

Access to electronic networks

Access to the Internet can be viewed as a 'ticket' to enter the IS. This access is often viewed as essential for individuals to gain in the coming years. In this section we elaborate on the rapid evolution and growth of the Internet. We also show that the growth in the number of individuals entering the Internet falls from over 100 percent in the early nineties to approximately 80 percent in the near future. *Table 2.3* shows the number of hosts in the world. From this table we observe that by approximation the number of hosts doubles every year. However, in the first half of 1997 we see a dramatic fall in the growth rate. The figures until July 1997 show a growth rate of 21% for the US, 23% for Europe and an even worse scenario for the other countries: 20% growth until July 1997, whereas growth rates of over one hundred percent were the standard in the early nineties.

Table 2.3: Number of Hosts in the World, 1993-1997

	01/01/93	01/01/94	01/01/95	01/01/96	01/01/97	01/07/97	$(Y_{97}/Y_{93})^{1/T}$ -1
USA	942.693	1.475.422	3.178.266	6.053.402	10.695.092	12.849.392	0.8353
Europe	303.828	587.135	1.106.077	2.284.750	3.921.946	4.840.248	0.8955
Other	66.479	66.479	154.443	567.657	1.528.962	1.850.360	1.1899
Total	1.313.000	2.129.036	4.438.786	8.905.809	16.460.000	19.540.000	0.8817

Source: Network Wizard (1997), RIPE (1997)

In *Table 2.4*, we observe an even worse scenario for the EU countries. In the first half of 1997 the number of Internet hosts in Austria and Portugal has actually fallen below the level of December 1996, whereas the growth rates for the other countries are marginal compared to the growth rates of more than 100% from 1981 to 1996.

Many predict a further slowdown of the growth rate. This observation is perfectly in line with the fact that it is difficult for an ordinary individual to access the Internet due to the high costs involved. Multimedia PCS are available in the US for less than US$ 1.000, about twice as much as in Europe. This contributes to a European household penetration rate of 15%, less than half the US figure. To lower the threshold of gaining access to the Internet, prices of PCS should drop by close to one hundred percent in order to give Europeans the chance to gain access to the Internet.

Table 2.4: Number of Hosts in the European Union, 1993-1997

Country	01/01/93	01/01/94	01/01/95	01/01/96	01/01/97	01/07/97	$(Y_{97}/Y_{93})^{1/T}$ -1
Austria	9.286	12.587	28.928	60.320	91.938	87.408	0.7738
Belgium	1.658	7.544	19.065	31.920	64.670	86.117	1.4991
Denmark	5.383	8.703	27.348	52.536	106.476	137.008	1.1089
Finland	19.606	35.705	71.639	230.473	283.526	335.956	0.9501
France	25.719	56.675	94.112	145.830	245.201	292.096	0.7572
Germany	66.043	120.034	209.268	467.024	721.847	875.631	0.8183
Greece	699	1.935	4.030	9.111	15.925	19.711	1.1847
Ireland	1.284	2.330	6.327	13.688	27.059	33.031	1.1426
Italy	8.725	18.027	32.334	78.255	149.595	211.966	1.0349
Netherlands	25.217	44.917	89.279	177.050	270.521	341.560	0.8098
Portugal	1.901	3.382	5.521	12.698	26.077	18.147	0.9245
Spain	6.578	15.155	27.040	56.604	110.041	121.823	1.0224
Sweden	26.648	42.251	79.658	153.574	232.955	284.478	0.7195
UK	53.599	117.076	240.299	458.927	591.624	878.215	0.8227
EU Total	252.346	486.321	934.848	1.947.710	2.937.392	3.723.147	0.8471

Source: RIPE (1997)

Furthermore, local telephone calls to connect to ISPs in Europe are not free, unlike in North America, where callers are allowed to make an unlimited amount of local calls under their basic service costs. The cost of local calls is likely to rise in some countries, as former telecom monopolies rebalance their rates in preparation for the opening of all services to competition in January 1998. The reason being that they remain monopolists in regional telecom provision. On

the European level former government owned telecom enterprises are forced to compete. A good example is the dramatic fall (50%) of telephone calls from the Netherlands to the US and France. Rates to other countries have fallen at similar rates. However, at the local level, Dutch Telecom (PTT Telecom) increased charges to guarantee its revenues. Knowledge of local customers is so specific that foreign competitors do not have a strong incentive to break the local monopoly. Furthermore, customers are so used to one (government owned) company offering telecommunication services that they are not willing to change to an unknown and most of the time foreign telecommunication company.

Aside from hardware and access costs, there are several infrastructure issues that at present are hindering the further diffusion of Internet throughout Europe. The development of broadband networks across Europe has been slow, and European leased-line prices remain anywhere from two to ten times higher than equivalent prices in the US. It is likely that these constraints dampen the growth of and access to the Internet. *Table 2.5* estimates the number of Internet users on 1 January 1996. Since real figures are not available, we use an upper and a lower bound to compute the number of users. The upper bound is determined by the number of PCS and the lower bound by the number of CD-ROM players in each country. We estimate that the total number of Internet users lies somewhere between 9.28 million and 21.98 million individuals. It is important to note that if we assume that the number of CD-ROM players equals the number of modems and that the number of users per modem is on average larger than one, the number of Internet users is likely to be closer to the upper bound of almost 22 million than to the lower bound of approximately 9 million users.

Table 2.5: Estimation of the Number of Internet Users, 01/01/1996

Country	Lower Bound Number of CD-ROM Players	Upper Bound Number of PCS
Belgium	273.000	585.000
Denmark	270.000	720.000
France	1.320.000	3.300.000
Germany	2.860.000	4.940.000
Greece	105.000	350.000
Italy	1.200.000	2.800.000
Netherlands	610.000	1.525.000
Spain	805.000	2.415.000
Sweden	315.000	945.000
UK	1.540.000	4.400.000
Total EU-10	9.298.000	21.980.000

Source: RIPE (1997)

Table 2.6: Estimation of the Number and the Amount of Purchases on the Internet, 1996

Country	Number of Purchases*		Amount of Money (US$)**	
	Upper Bound	Lower Bound	Upper Bound	Lower Bound
Belgium	29.250	13.650	2.925.000	1.365.000
Denmark	36.000	13.500	3.600.000	1.350.000
France	165.000	66.000	16.500.000	6.600.000
Germany	247.000	143.000	24.700.000	14.300.000
Greece	17.500	5.250	1.750.000	525.000
Italy	140.000	60.000	14.000.000	6.000.000
Netherlands	76.250	30.500	7.625.000	3.050.000
Spain	120.750	40.250	12.075.000	4.025.000
Sweden	47.250	15.750	4.725.000	1.575.000
UK	220.000	77.000	22.000.000	7.700.000
Total EU-10	1.099.000	464.900	109.900.000	46.490.000

* It is assumed that five percent of all users buys articles from the Internet.

** The average amount of money spent is assumed to be US$ 100.

Once we have estimated the number of EU users, we can ‘guestimate’ the value of the EU market. The Yankee Group Europe estimates that the total value of the access market, including Internet access, local call charges, and second lines is about US$ 2.6 billion in Europe. This value is expected to steadily increase to US$ 12.0 billion in 2001. We have estimated the value of the Internet shopping market in EU countries in *Table 2.6*.[14] About five percent of all Internet users

buy products online, purchasing roughly US$ 100 per person per year.[15] Again by using an upper and lower bound, we see that for the EU the number of sales lies approximately between almost 500.000 and 1.1 million. In 1996, online transactions were between US$ 50 million and US$ 1.1 billion.

In a study of Internet access by US companies, O'Reilly & Associates[16] report that 50% of large, 25% of mid-sized and 8% of small US businesses had access to the Internet in 1996, for a total of more than half a million establishments. Based on O'Reilly's findings, past growth curves and the expected incorporation of the Internet into banking and credit card activity, ActivMedia[17] predicts numbers will swell to 5.9 million, or 92% of US business establishments, by 2001. With nearly every large US business connected and pressure to upgrade computer systems mounting, the connectivity market will remain vibrant. Worldwide business access to the Web is expected to grow at an even faster rate than in the more mature US market - from 1.3 million at the end of 1996 to 8 million by 2001. Much of this growth will be in the Pacific Rim, followed by Europe. India, South Africa, Israel, China and a few dozen other nations are beginning to develop Internet infrastructure, but are not expected to blossom until the next century, when US and Japanese penetration will be nearly complete. The growth of web generated sales on a worldwide basis will be even more dramatic according to ActivMedia - from US$ 13.3 billion in 1996 to US$ 314 billion in 2001.

The only major limiting factor in sight to curtail growth of the Internet and commercial websites is whether the infrastructure development can keep up. Competitive pressures among web developers and storage providers promise to keep the price of entry low. Cost cutting and competitive pressures among marketeers continue to push more toward electronic marketing.

Hence, the further evolution of the IS can be stimulated by the development and provision of a decent infrastructural framework and competition among all agents in the electronic commerce market, *e.g.* service providers. This development might lead to a radical change in the way consumers provide themselves with products. Consumers can travel all over the world in the virtual environment of the Internet and buy products everywhere. The implications of this changing attitude have strong effects on government policies. In the next section we discuss the effects of this rapidly expanding process for the tax base.

A changing society: a changing tax system ... ?

VAT problems

Contemporary governments have increasing difficulties in collecting taxes and maintaining an adequate tax base. There are two main reasons for this perturbing phenomenon. The first relates to the gradual world integration of economies; EU countries in particular face problems in this regard. As the world becomes more integrated, and as capital and high-skilled labour can move more easily and freely from high-tax countries to low-tax ones, a nation's tax regime has to adapt to some world standard because people and businesses can and will exploit differences in tax regimes. A nation can attract capital and high-skilled labour through tax exemptions.[18] This can lead to in- and outflows of (human) capital. Countries with high tax rates such as Germany, Italy and Japan can suffer from an outflow of capital and high-skilled labour. As capital and high-skilled labour flow out of these countries the tax burden will be increasingly on medium- and low-skilled labour.[19] This may eventually lead to an eroding tax base. At the same time the growth of electronic commerce accelerates this globalization of our economies by eliminating borders between countries. This development makes it extremely difficult to trace and therefore tax business transactions. Cordell (1997) argues in this respect:

> *"[f]irms using information technologies can issue orders, manage inventories, buy resources, design products, do research just about anywhere in the world. Firms can bring together all factors of production to produce goods and services anywhere on earth: global information and communication technologies mean that corporations can have a virtual presence anywhere. With global brand names the final product is produced anywhere; the final product is sold*

anywhere." (p. 2)[20]

Globalization also affects consumer choices. On the one hand, physical country borders no longer determine the mobility of individuals. For example, residents from the Netherlands travel to Luxembourg to handle their finances while picking up petrol in Belgium. On the other hand, the Internet boosts virtual mobility and globalization. Individuals surf the Internet from one country to another and act like rational agents looking for the best price-quality ratio while taking into account shipping costs. *Table 3.1* gives an indication of the rapid evolution of the IS. An indicator for the growth of Internet communication is approximated by examining the revenues lost by telephone companies as a result of alternative communication mediums. This loss is created by *e.g.* sending an e-mail rather than making a long-distance telephone call. The table shows a dramatic increase in Internet telephony, e-mail and Internet fax over the next four years.

Table 3.1: The Internet's Impact on International Telephony Revenues (US$ millions)

Carrier	Country	Estimated Internet Revenue		Losses to Internet Telephony		Losses to E-mail		Losses to Internet Fax	
		1997	2001	1997	2001	1997	2001	1997	2001
AT&T	USA	9.422	9.272	5,18	231,75	37,02	72,87	1,36	44,82
Bezeq	Israel	263	253	0,47	21,40	0,86	6,17	0,02	2,58
BT	UK	1.366	1.455	1,21	69,99	8,22	24,79	0,18	8,35
Deutsche Telecom	Germany	4.349	3.989	2,20	126,97	13,49	39,49	0,20	8,50
Embratel	Brazil	481	764	0,47	59,40	4,27	28,37	0,10	11,07
Etisalat	UAE	897	1.681	0,05	17,45	0,55	10,01	0,01	2,77
France Telecom	France	1.725	1.249	1,20	64,05	9,27	24,54	0,15	5,73
Hongkong Tel.	China	2.132	3.670	0,33	36,99	1,57	14,55	0,03	4,54
Kokusai	Japan	1.936	2.644	2,82	194,17	22,40	86,20	0,41	26,17
Singapore Tel.	Singapore	1.047	1.743	0,63	36,97	2,59	12,07	0,05	3,78
Stentor	Canada	567	621	0,81	38,88	8,04	15,73	0,12	4,98
Telecom Italia	Italy	2.037	1.938	1,22	105,15	6,65	43,55	0,14	12,69
Telkom S.A.	South Africa	322	443	0,24	32,98	1,15	9,93	0,02	3,22
Telmex	Mexico	1.629	1.389	0,64	25,95	4,27	10,74	0,17	6,98
Telstra	Australia	1.109	1.694	1,77	114,76	10,84	38,17	0,25	14,77
VSNL	India	585	1.665	0,07	27,04	0,86	25,77	0,02	8,97
Total		39.867	34.470	19,31	1203,90	132,05	462,95	3,23	169,92

Source: Telecom Daily, 8 September 1997

In the EU a Value Added Tax (VAT) is the most common consumption tax, while the US uses a system of sales taxes. In both the EU and the US, excise duties are levied on some goods such as petrol, alcoholic drinks and cigarettes. The system of VAT works fairly well in the EU because it uses intermediaries and it is incentive compatible. Intermediaries are involved in the entire production process: from raw materials to the final product. These intermediaries are quite willing to participate in the VAT system and to cooperate with tax authorities because they charge the VAT to the next intermediary in the production process and, in the end, to the final consumer. In addition, they are reimbursed by the tax authorities for the VAT they pay to an upper chain intermediary. As such, an intermediary only pays VAT on the value he adds to the product. Thus, the eventual burden is on the final consumer. In an international setting a customs officer acts as the intermediary and hence taxes the incoming product at the border of the particular country.

Table 3.2: VAT Diversion in the European Union

Country	VAT Rates		Specific Products			
	Low	Normal	Newspapers/ Books	Art	Journals	CDS
Austria	10/12/16	20.0	10.0	20.0	20.0	20.0
Belgium	1/6/12	20.0	1.0	20.0	20.0	20.0
Denmark	-	25.0	0.0	25.0	25.0	25.0
Finland	0/6/12/17	22.0	0.0	22.0	22.0	22.0
France	2.1/5.5	18.6	2.1	18.6	18.6	18.6
Germany	7	15.0	7.0	15.0	15.0	15.0
Greece	3/8	18.0	3.0	18.0	18.0	18.0
Ireland	2.5/10/12	21.0	2.5	21.0	21.0	21.0
Italy	4/9	19.0	4.0	19.0	19.0	19.0
Luxembourg	3/6/12	15.0	3.0	15.0	15.0	15.0
Netherlands	6	17.5	6.0	17.5	17.5	17.5
Portugal	5	17.0	5.0	17.0	17.0	17.0
Spain	3/6	16.0	3.0	16.0	16.0	16.0
Sweden	0/12/21	25.0	0.0	25.0	25.0	25.0
UK	-	17.5	0.0	17.5	17.5	17.5

Electronic commerce threatens EU VAT revenues for two reasons.[21] For one, electronic commerce removes the intermediary from the production and distribution chain. A consumer can *linea recta* contact the producer of the good he wants to purchase. A person wanting a Salvador Dali painting no longer has to go to an art gallery but instead surfs the Internet to Dali's homepage and directly orders the desired painting. This leads to a fall in VAT revenues because most of the intermediaries have disappeared. The second reason why electronic commerce threatens VAT revenues is the fact that VAT rates in the EU are both as such very different and divert on specific products. *Table 3.2* shows VAT rates ranging from over 20% in Sweden, Belgium and France to 15% in Germany. These large differences influence consumer behaviour in the EU. Moreover, some countries exempt particular goods from VAT, *e.g.* in the UK VAT on books and newspapers is zero. Consumers from the other EU member states have an incentive to order their books from the UK using the Internet. In general, we observe that due to increasing "consumer mobility" countries with high VAT rates may suffer from the increasing use of electronic commerce. Their VAT revenues will fall, while countries with low rates of VAT will observe larger revenues. In short, globalization and economic integration place forward the condition for further integration and, more importantly, harmonisation of VAT rates.

To further illustrate the above tax problems, we make a distinction between goods flowing inside the EU and goods coming in from outside Europe, *i.e.* intra EU trade and extra EU trade. Goods coming in from outside Europe (extra EU trade) are handled by a customs officer. His role is of crucial importance: goods flowing into the EU are taxed according to the tax law of the country of destination. Thus, if a leather coat is purchased online in the US by a Swedish citizen, the customs officer at the Swedish border levies 25% VAT on the coat. Tax offices like Inland Revenue claim that UK customs officers trace all packages crossing the UK borders. This may

be true but seems unlikely due to the high volume of goods entering the UK and the impractability of checking each one. Thus, it seems likely that many goods, such as compact discs (CDS), are entering the UK from *e.g.* the US without VAT being levied.

Can the custom officers be the intermediary in the age of electronic commerce? For tangible goods this is to a certain extent possible. “Higher-valued” goods are registered when entering the EU, while other goods with lower values can flow freely amongst EU countries. With respect to services, it is very difficult, if not impossible, to trace their flow and hence levy taxes. With services, the only opportunity to levy a tax is to trace where the final user of the service resides. For this, voluntarily disclosure by end users is required. If producers are the end users of services, then this does not pose a problem since producers will be willing to disclose the services they receive because they can pass on the VAT charges. If the final user is an individual consumer, VAT revenues will fall as they try and avoid the payment of taxes.

Another option possible to obtain the foregone tax revenues on services is to shift the responsibility of disclosure to the producer of the service. In this case, the producer charges VAT directly, by increasing the price of the service by the relevant VAT rate. From a legal perspective this is no problem for producers residing in the EU because they can shift the tax burden. Producers residing in the US, however, run into problems. With the US sales tax system it is impossible to shift the tax burden. Thus, a US citizen does not pay a sales tax on services because if the government announces a sales tax on services this will worsen the competitive position of US firms. In other words, it would give US firms a comparative disadvantage. It is therefore not surprising that IBM has proposed a duty free Internet, stating that:

> *At a time when the U.S. Treasury and the White House have taken the more prudent route of advocating no new taxes on commercial Internet activities and are encouraging policies designed to foster its rapid expansion and development, proponents of the "bit tax" have stepped to the fore as the only group to be going in the complete opposite direction. A number of U.S. state and local movements towards taxation have reversed position, some due to pressure from the business and user community (i.e., Tacoma, Washington), others as a consequence of further study (i.e., Florida). Still others have taken the positive approach of seeking to foster Internet related activities in their jurisdictions (New York) by adopting Internet friendly tax laws and regulations, and others have adopted resolutions advocating support of the Clinton Administration's view (Georgia).*[22]

The argument used by the Clinton administration is basically that it is too difficult to trace and localise the Internet user. If a sales tax is levied on US services, they would become much less attractive to foreign consumers because they are simply too expensive. The effect of a duty free Internet is advantageous to US firms relative to EU firms because EU firms still face the VAT system while the goods and services of US firms are entirely tax free.[23]

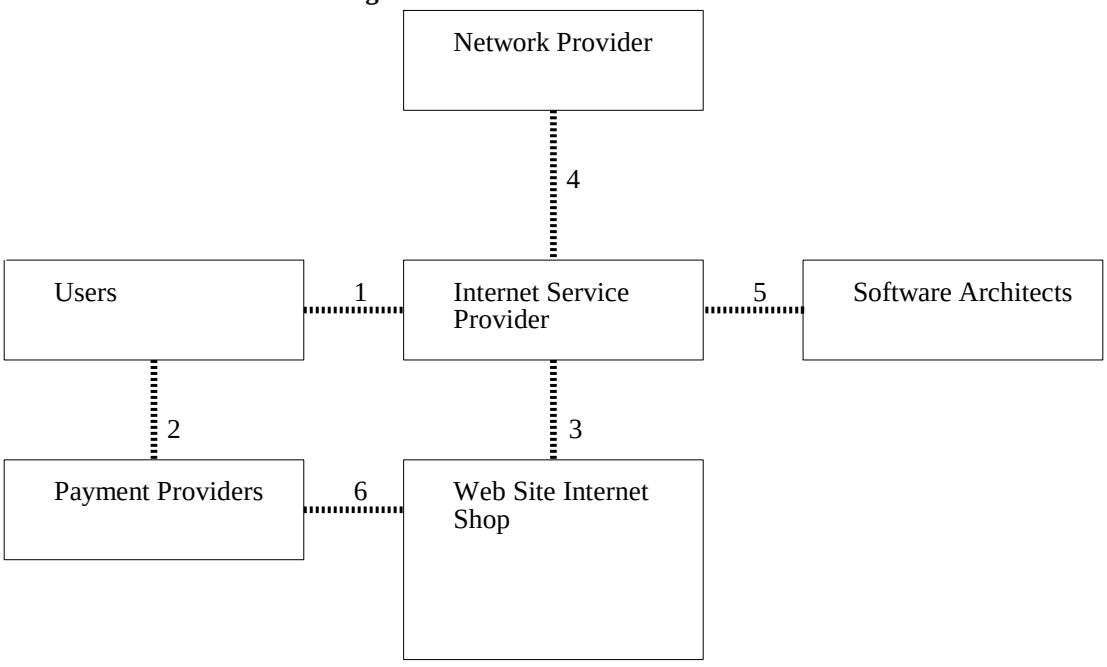
So far we have discussed how tax revenues will suffer from the increasing use of electronic commerce. In the next section we discuss and evaluate different methods to prevent the tax base from further erosion in the IS.

Fighting tax erosion

Taxing electronic commerce - and in particular a bit tax - is a very controversial and hotly

debated issue on the agenda of both large computer manufacturers (*e.g.* IBM),[24] government agencies, *e.g.* the European Commission,[25] and scientists.[26] Those opposing a tax on electronic commerce argue that it is "a tax on the IS" and runs the risk of slowing down the IS's evolution. However, in our view, the only way to appropriately dismiss such a tax is to do so on the basis of research - *i.e.* through macro econometric methods or models. Cordell (1997) argues that a tax on gasoline did not slow down the development of the automobile industry. We have to consider such statements with a certain amount of caution, because the implicit assumption is an inelastic demand for cars. Whether the demand for accessing the Internet and more importantly the demand for using the Internet is inelastic remains an open question.[27] In this section we introduce three proposals to fight tax erosion. In order to build up a comprehensive analysis of these proposals we illustrate a business model to show the opportunities for taxation. *Figure 3.1* shows the basic business model for the Internet with all key players involved. These players are Network Providers (NPs), ISPs, Users, Web site Internet Shop, Payment Providers (PPs) and Software Architects (SAs).

Figure 3.1: An Internet Business Model



We can identify the following six flows of money and services:

1 The User or potential Internet Shop customer pays a fee to the ISP who supplies an Internet Connection. This gives the user access to various Internet services such as WWW, e-mail etc.

2 The User visits a Web Site or Internet Shop and decides to purchase goods and/or services. To pay for items, the user obtains a payment system from a financial institution - the PP (bank). The PPs also provide various services related to the system.

3 The Web Site Internet Shop purchases a permanent Internet connection or space on the ISP's computers from the ISP.

4 To provide the User with access to the Internet, the ISP purchases a set amount of bandwidth from a NP.

5 SAs supply the Internet Shop with the software required to enable connection to an ISP and to allow customers to browse the shop.

6 If customers buy their products with a *e.g.* credit card, there is a revenue flow from the PP to the Internet Shop and a revenue flow from the Internet Shop to the PP to deal with commission cost.

The first proposal is for the ISP to become the new tax intermediary. The Internet user or

potential Internet customer, pays a fee to the ISP who supplies an Internet connection. This gives the user access to various Internet services such as the Web, e-mail etc. Since ISPs know the identity of the user, they could take the responsibility of keeping track of all financial transactions a particular user makes. This is already feasible from a technical point of view: ISPs can become the new intermediaries because they can perform identity checks on new commercial users and can account for Internet Protocol numbers (IP numbers). To be able to account for IP numbers they need NPs. NPs are useful and necessary in two ways. First, telecommunication bandwidth is in one sense a distribution chain and large bandwidth use is an indicator of commercial activity. Second, as distributors of IP numbers they can ensure proper accountability for IP numbers they issue. Once the user is identified the ISP can keep track of all transactions this particular user makes. All these transactions can be put on a specified bill the user receives every month. Once this happens it is very easy to levy VAT on the products the individual has purchased; it is similar to the telephone invoices received each month. There is one problem with this system however. It is currently not possible to trace IP numbers because they are assigned randomly. In the near future it is possible that every single subscriber to an ISP will receive a personal IP number, similar to the case of credit card numbers.

An advantage of this proposal is that the VAT system remains unchanged and unchallenged. However, a disadvantage of imposing VAT on the Internet use is the increasing cost of using the Internet. These higher cost could lead to a slow down of the growth of the Internet, or even to an absolute decrease in the number of users. This can have negative effects on the further evolution of the Internet in particular and the IS in general. The exact effects of the levying of VAT on Internet transactions are unknown, but are currently being investigated at the Maastricht Economic Research Institute on Innovation and Technology (MERIT).[28] In addition, the previous

section of this paper maps all features of the Internet market.

The second option is to appoint the financial community as intermediary in Cyberworld. However, until now financial institutions were never pushed into the role of authority and they do not trample to enter this role of control.[29] Two options are available that allow the financial community to act as tax intermediary. For one, using electronic money (e-cash) for all electronic commerce transactions would allow VAT to be charged on the e-cash and incorporated in the price of this new form of money *e.g.*, one unit of e-cash incorporates a certain percentage of VAT. Two, credit card companies can levy VAT on all transactions their customers make on the Internet. PPs can introduce e-cash for all electronic commerce transactions and in this way monitor all transactions individuals make on the Internet. PPs can simply monitor all transactions their customers make on the Internet and levy VAT on the final bill.

A bottle neck with having financial institutions act as the intermediary is that in order to levy VAT on e-cash or a credit card transaction both the financial institution - the bank or the credit card company - and the customer have to reside in the same country. This is not always the case. This problem can be easily solved, however, because a credit card needs to be fed from the customer's home country. If we are able to trace this feeding we can tax at the source. This taxing at the initial source is the general reasoning behind the idea Tobin (1984) launched for raising an international uniform tax on all spot conversions of one currency into another.[30] Like taxing electronic commerce, the Tobin tax is criticized because of its implementation difficulties. The implementation problem is characterized by the public goods nature of the tax. This implies two things: unilateral action is totally ineffective and concerted action will be confronted with the free-rider problem.[31]

Upon closer examination of *Figure 3.1* we observe that Web Site Internet Shops can also play a role in the collection of VAT. Since tax authorities have full access to those parts of a website containing transaction logs and financial data, it would be quite feasible to implement payment of tax directly from the business website to the tax-authorities website. Furthermore, in developing internationally accepted identification and authentication standards applicable to financial transactions, SAs can build a system, embedded in popular web browsers such as Netscape Explorer or Microsoft Explorer, to enable reporting of financial transactions.[32]

The final option we consider is the method of last resort: the bit tax. The bit tax is basically a tax on the volume of the transaction (the number of bits sent) rather than the value of the transaction. The bit tax is equal to an excise duty: a taxation on the use of the information superhighway's bandwidth. The original bit tax proposal was made by Cordell and Ide (1994) in a Club of Rome report.[33] They argue that the existing tax structure on value would no longer make sense in the information society and propose a bit tax as a replacement for VAT on information technology goods and services, rather than as an additional tax. Furthermore, they argue that VAT is heavily based on the material inputs that occur at different stages of the manufacturing process and is, as such, not well-suited to 'intangible' services. In the case of information and communication services it is very difficult to talk in any real or meaningful way about a tax on value added. A telephone call is currently priced and taxed in relation to distance and time and has no relationship to the possible value of the communication. Therefore, we need the bit rather than the second as the fundamental unit of measure to minimise the leakage and erosion in the contemporary tax system. Cordell (1997) argues that it is an easily administrated tax on each digital bit of information. Furthermore he recognizes:

> *"[w]hether the digital bit is part of a foreign exchange transaction, a business teleconference, an Internet e-mail of file transfer, electronic check clearance or an ATM transaction, each bit is a physical manifestation of the new economy at work."* (p. 9)[34]

Taxation on that basis might save small-scale users money while increasing the tax burden on large-scale users. The bit tax would be paid by individual users and levied by their online ISPs. In addition, the bit tax should be a generic tax exerted on all electronic traffic and be introduced on a world-wide basis to avoid distortions. The common rate of taxation is set by Cordell randomly at 0.000001 cent per bit. A major advantage of the bit tax, although it taxes volume instead of value, is that the collection will cause less distortions to the economy than most other direct or indirect taxes. Collected by ISPs or NPs the revenues will flow directly to the national tax authorities of the respective country, omitting the problem of residence.

Although the exact implementation of such a tax is not yet clear, the general idea of a tax on information from the point of view of an eroding tax base and the changing society is certainly worth considering. Furthermore, the tax revenues could be directed towards improving access to the Internet, educating individuals to become acquainted with the Internet and providing additional needed bandwidth.

Concluding remarks

The idea of taxing electronic commerce has been met with a barrage of negative reactions on the side of policy makers, industry and consumers. Nevertheless, over the past year, the issue of an eroding tax base linked to the development of electronic networks replacing physical ones has grown in importance. Although the exact implementation is very hard to accomplish, the general idea of a tax on information from the point of view of an eroding tax base and the changing society, certainly is worthwhile considering. Furthermore, the tax revenues can be moved directly towards improving access to the Internet, educating individuals to become acquainted with the Internet and providing the additional needed bandwidth.

Building a business model gives us the advantage of the feasibility of the implementation of a tax on electronic commerce. We have seen that the implementation problems can be overcome by either enforce ISPs or PPs as tax collectors. ISPs can monitor all transactions their customers make. Hence, they can put VAT on these transactions. ISP customers receive at the end of the month not only the bill for access but also a bill including VAT regarding the transactions they made. PPs can by either e-cash or credit card numbers trace the transactions of Internet users. E-cash can be taxed *ex ante* if it is not possible to locate the user, otherwise users receive an e-cash bill including VAT at the end of each month. Furthermore, a credit card company can record all transactions and announce VAT on it. Finally, as a method of last resort, the bit tax can be implemented. Now, ISPs keep record of all bits flowing over the Internet.

Next to this, we have to improve access to the information society by stimulating people and making people aware of the fact that ones they miss entrance to the IS they fall behind forever.

This awareness can be created in providing proper training and education programmes. In addition, the cost of entering the information society have to fall dramatically in order to guarantee equal chances for all citizens. On this view of things, a tax on electronic commerce can turn out to be a useful tool in redistributing income and giving people a ticket to enter a new age. In addition, such a tax can provide the economy with extra needed bandwidth and the development of a comprehensive Internet.

Notes and references

1. See, *e.g*. European Commission, Advanced Communications for Cohesion and Regional Development, Accorde, Final Report, Brussels, Commission of the European Communities, DG XIII, 1995 on the development and adjustment of workers, firms and governments towards the IS.

2. Freeman, C. and L. Soete, *Work for All or Mass Unemployment?: Computerised Technical Change into the Twenty-First Century*, Pinter, London, 1994, advocate for more and comprehensive education and improvement of the way to acquire knowledge.

3. See, *e.g.* the European Centre for Work and Society, The Impact of Technological Change on Employment within the European Union between 1984 and 2025, Luxembourg, European Parliament, 14 February, 1995 on how to cope with the implications of technological change in society.

4. Bandwidth has only increased from 56 kilobytes per second in the late eighties to 45 megabytes per second in 1996. In the near future bandwidth is expected to increase to 1 gigabit per second.

5. See, *e.g.* Stahl, D.O., A Critical Survey of Internet Pricing Proposals, in: Dumort, A. and J. Dryden (eds.), *The Economics of the Information Society*, EUR 16676 EN, European Commission/ OECD, 1997, Brussels/ Paris, pp. 142-154 for a critical survey on Internet pricing proposals. He argues that since most of the costs are sunk into infrastructure, the marginal cost of Internet data transport are essentially zero, so if Internet resources were private goods prices should be zero. In addition, Internet resources are public goods and consequently congestion is a potential negative externality. Marginal-cost pricing of public goods can lead to a so-called tragedy of the commons in which the common resource is over utilised, causing avoidable losses for society as a whole. He discusses the dynamic optimal pricing model, the smart-market approach to congestion pricing, the voluntary user declaration model and the connection-only and flat-rate pricing proposal.

6. In a conversation Ter Weel had at Inland Revenue with Mr. Holden and Miss Clare it became clear that a change in the tax system would have serious consequences on government. The only change Inland Revenue predicts is a shift towards environmental taxation. However, a new 'tax-cow', such as information, is out of the question. In addition, Inland Revenue is satisfied with the current tax system. According to Holden and Clare, the tax leakages are minimised and a new tax does not necessarily improve the system.

7. The High Level Expert Group, Building the European Information Society for Us All, Final Policy Report of the High-Level Expert Group, Employment and Social Affairs, European Commission, 1997 recommends "a reassessment of the indicators used for economic policy-making purposes is urgently needed. At a time when both policy-makers and markets appear to rely more and more on such apparently 'objective' economic performance measures, there are tough questions to be asked concerning the bias implicit in the reliance on material production in constructing such measurements. There must be an attempt to produce a more accurate measurement of 'real' inflation and 'real' output growth, taking fuller account of ICT-based quality improvements, as well as the rapidly growing number of information products and services." (p. 31)

8. Soete, L. and K. Kamp, The Bit Tax: The Case for Furhter Research, Science and Public Policy, 1996, 23(6), 353-360 and Soete, L. and K. Kamp, *The Bit Tax: Taxing Value in the Emerging Information Society*, MERIT RM 2/96-019, 1997, MERIT Maastricht.

9. Other arguments opposing taxing electronic commerce in general and taxing bits in particular are:
   1) A transmission tax is in no way related to the economic value of the good. A videoclip sent to a friend, with no commercial value but containing a large number of 'bits' would incur a much higher tax bill than a commercial database made up of fewer bits. The videoclip has no commercial value, if sent via normal mail the videoclip would hardly be taxed at all, while the database would be largely under-taxed by a bit tax.

2) No such tax exists for other methods of information transfer (*i.e.* fax), - so why would there be any on this one?
3) It is a tax on freedom of speech. It penalises the private user as much as the commercial user, with no differentiation tax-wise between them.
4) It could discourage the development and usage of the Internet resulting in economic inefficiencies. It could give rise to peculiar incentives, *e.g.* artificially compressing data or maintaining it in analogue form, so as to avoid paying a tax based on bits or bit count. Another economic distortion could be that companies 'build' intra-nets to avoid Internet taxes.
5) The Internet is 'environmentally friendly' in that it reduces the use of paper and other media that incur higher environmental costs. A bit tax might discourage Internet usage and thus have negative environmental consequences.
6) It may be difficult to implement, *i.e.* bits are difficult to count within statistically shared networks and could be hidden by encryption.
7) If not implemented on a world-wide scale it could lead to distortions in competitiveness. Otherwise, online transactions may simply be deferred to a jurisdiction where no such tax exists.

10. We use the number of CD-ROM players as an indicator for the number of modems since there are no figures available with respect to the number of modems in the EU. We assume that the number of CD-ROM players is equal to the number of modems.

11. See *Elsevier*, Moet Ik Nu Echt Digitaal?, vol. 31 no. 2, August 1997.

12. Philips, for example, was never able to convince people that they had to buy their CD-I player. In addition, the DAT recorder and the HDTV were a flop too.

13. See *e.g.* HLEG (1997) pp. 22-25.

14. The number of Internet purchases is still low because people do not think it is safe to buy products online. They are afraid that hackers can trace their credit card numbers and abuse this information. On British television a IBM commercial is broadcasted which guarantees the safety of an individual's Internet transaction.

15. See *e.g.* Australian Tax Office, *Tax and the Internet*, Discussion Report of the ATO Electronic Commerce Project, 1997 for a justification of the values we take for the volume of sales and the amount of money involved.

16. http://www.ORA.com

17. http://www.ACTIVMEDIA.com

18. The Economist, May 31st 1997, argues that "[t]hose who advocate harmonisation say that the alternative is a 'race to the bottom', as governments sacrifice social spending on the altar of competitiveness." (p. 11)

19. In this paper we are not concerned about the exact definition of high-, medium- and low-skilled labour. For a superb analysis of different types and levels of skills see *e.g.* Muysken, J. and B. ter Weel, Does Overeducation Reduce Unemployment?, Mimeo Maastricht University.

20. See The Economist, May 31st 1997, and Soete, L. and K. Kamp, *The Bit Tax: Taxing Value in the Emerging Information Society*, MERIT RM 2/96-019, 1997, MERIT Maastricht and Soete, L. and K. Kamp, Taxing Consumption in the Electronic Age, Intermedia, 1997, **25**(4), 19-22 for a similar line of argumentation.

21. The VAT rules for the taxation of services in general are contained in Article 9 if the EC Sixth Directive of 1977. These are known as the place of 'Supply of services' rules. The general rule of service supply is

based on the location of the supplier's business establishment, other fixed establishment from which the supply is made or place of residence. See *e.g.* Ganguly, R., *Taxation of Cyberspace Transactions: Working Towards Solutions,* Paper presented at the 1997 Spring Symposium, 1997, Harvard Law School for a good overview.

22. IBM's response to the bit tax proposal is available on the MERIT Homepage

23. See, US Department of the Treasury; Office of Tax Policy, *Selected Tax Policy Implications of Global Electronic Commerce*, November, 1996.

24. IBM believes that such a tax proposal is long on social theory and short on practical detail. No clear plan of implementation has emerged, leaving many questions unanswered. Specifically, IBM argues that most countries have an embedded tax or universal service charge already included in the structure of their telecommunications tariffs. In addition, data transmissions over the public switched network are already subject to a wide variety of telecommunications taxes. Therefore, a tax on electronic commerce would be additive. Also, most data are in private networks - analogous to private intercom systems. IBM points out that taxes generally follow revenue flows where accounting systems already exist. Accordingly, an electronic commerce tax regime would require the creation of an accounting system with, in their view, no underlying revenue or economic justification. Finally, creating a new tax system to monitor the tax collection in a global network of networks, the keystone of which is the free flow of information and where the use of proxies and filters can be used to easily reroute information flows, would require the diversion of a vast amount of development effort from areas now creating enormous economic and educational value to users to an activity which has no underlying economic or business value.

25. The European Commission also opposes a tax on electronic commerce. First and foremost they argue that such a tax constitutes a radical departure from value based taxation and as such would lead to a substantial distortion of production and consumption decisions and to inefficiency. Similar to IBM's argument, the Commission states that the tax is not practicable in terms of measurement and implementation, that it is incentive incompatible and would encourage avoidance. Finally, the Commission argues that a tax on electronic commerce would severely distort consumption choices on low priced or flat rate priced purchases.

26. For other arguments against the taxation of electronic commerce see, *e.g.*, Beck, H. and A. Prinz, Should All the World Be Taxed? Taxation and the Internet, *Intereconomics*, 1997, Blum, D.C., State and Local Taxing Authorities: Taking More than Their Fair Share of the Electronic Information Age, *The John Marshall Journal of Computer & Information Law*, 1996, **3**, 493-522, Du Bois, M. Down on the Levy: Next Time Your PC Crashes, Take it as Tax Deduction, *Convergence*, 1996, Gleckman, J., The Tax Cometh to Cyberspace, Governments Want a Piece of Pie. But What Will Work? *Business Week*, 9 December 1996, 44-45 and Schneideran, Three Myths about Government, Markets and the Net: A Special Report on the Clinton Administration's Plan for Global Electronic Commerce, *ENODE*, **2**(4), 1997.

27. On the other hand, tax revenues could be used to improve Internet access and usage. Taxes on car usage are used to maintain and build roads. In a similar fashion, electronic commerce taxes can be used to improve access and increase bandwidth. Particularly, in the EU, the improvement of the Internet is highly preferable. Critics of the fair distribution of taxes might argue that not all car taxes are used to maintain and improve roads. By the same token, they argue that taxes on electronic commerce just enter the large tax container and are not used to improve the use of and access to the Internet. This neglects the fact that governments undoubtedly play an essential role in safeguarding competition in the IS and in regulating the market to give every single inhabitant the opportunity to enter the IS. In addition, if we face an eroding tax base, governments have to search for other means to guarantee their revenues. As such, a tax on electronic commerce could turn out to be a useful tool in redistributing income and giving people a ticket to enter a new age. In addition, such a tax can provide the economy with extra needed bandwidth and the development of the Internet.

28. See *e.g.* Meijers, H., *Information Society: New Ways of Work*, Final Report to the Statistical Office of the European Communities, MERIT Maastricht for a first explorative study on the consequences of the IS.

29. Currently, Dutch banks are forced to report unusual transactions to an authority for investigation. However, banks do not like to know "too much" about their customers.

30. For a discussion of the Tobin tax we refer to Eichengreen, B., J. Tobin and C. Wyplosz, Two Cases of Sand inthe Wheels of International Finance, *The Economic Journal*, 1995, **105**(1), 162-172 and Van Liederkerke, L., *The Tobin Tax: A Tool for Monetary Reform and Distributive Justice*, Centrum voor Ethiek, UFSIA, 1997.

31. Frankel, J.A., *How Well Do Foreign Exchange Markets Function: Might a Tobin Tax Help?*, NBER Working Paper Series, no. 5422, 1996, Cambridge MA argues that a Tobin tax has been advocated for at least three different purposes:
    1) As a tool for monetary reform to restore some form of monetary autonomy for national governments;
    2) To reduce excess volatility in capital markets by shifting resources away from speculators to long term investors;
    3) As a market conform instrument to raise revenue for international projects or organizations.

32. These last two options are taken from ATO (1997).

33. Cordell, A.J. and J. Ide, *The New Wealth of Nations, Taxing Cyberspace*, 1994, Between the Line Publishers.

34. Cordell, A.J., *International Tax Program and the Society for Law and Tax Policy*, Paper presented at the 1997 Spring Symposium, Harvard Law School, 1997.