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Measuring Electronic Commerce

INTERNATIONAL TRADE IN SOFTWARE

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Working Party on the Information Economy

MEASURING ELECTRONIC COMMERCE:
INTERNATIONAL TRADE IN SOFTWARE

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FOREWORD

This report addresses issues of measurement related to international electronic transactions and was submitted to the Working Party on the Information Economy. Published under the aegis of the Committee for Information, Computer and Communications Policy (ICCP), it was prepared by Alessandra Colecchia of the Directorate for Science, Technology and Industry.

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MAIN POINTS

Electronic commerce is creating a new mode of delivering new types of products in a global market in which geographical boundaries and location lose their meaning. This paper, which is an extension of earlier work on measuring electronic commerce, focuses on how the Internet will affect practices of measuring and thinking about trade transactions.¹ It uses available sources and statistics for software to try to measure the extent to which international transactions are, or could become, “digital” and raises policy issues related to international trade in electronic markets.

Most countries’ value added taxation (VAT) systems require making a distinction between goods and services. Goods and services also fall under distinct trade agreements - the GATT and the GATS, respectively. Yet, newspapers, software packages, and CDs can now be converted into bits and delivered electronically, and the same will be true for other goods in the future. The growth of electronic commerce will probably require a re-evaluation of how certain transactions are classified.

Even if the available data are poor, evidence on on-line software sales, together with data on the growing and globalising market for packaged software, can be used to show that:

- While the “digital” industry is not yet covered by international statistics, US data suggest that it is large and growing rapidly.
- Pre-packaged software is the most dynamic software industry segment. Worth \$109.3 billion in 1996, it is expected to double by 2002 (\$221.9 billion).
- Traditionally dominated by the United States, the packaged software market is becoming global. Software markets in Canada, France, Germany and Japan have shown above OECD average growth rates. The German market is estimated at 8.6 per cent of the world packaged software market.

Measuring and mismeasuring software trade

Tracking software imports and exports in trade statistics is fraught with measurement problems. Border valuations are often based on the medium (diskettes, CD-ROMs) rather than on content (the software); moreover, methodology may not be consistent over time, shipments, or countries. Statistics not only underestimate the value of the software contained in the medium, but also fail to measure more generally the value of copyrighted works sold in foreign markets (the gold-master problem). Finally, bundling of software with the sale of a computer creates another sizeable source of mismeasurement. Nevertheless, the following tentative conclusions can be drawn:

- It is difficult to measure internationally traded physical software. Estimates of US software exports to Japan in 1994 varied between \$209.8 million and \$2 436.2 million.

- Based on available estimates from leading US independent pre-packaged software vendors, US software exports represent slightly less than half of total sales. Top Canadian packaged software firms have a high propensity to export, with an average 90 per cent of their revenues coming from abroad.

Electronic software delivery and its implications for international transactions

In addition to the traditional modes of supply (across-the-border trade, bundled in hardware, trade through commercial presence), software products can now be converted into bits and shipped directly over the Internet. This trend, the so-called electronic software distribution (ESD) revolution, will increasingly reorient domestic and international transactions from already hard to measure physical transactions to intangible electronic exchanges. Evidence on ESD indicates that:

- Among digital products, software is the best on-line seller and will increasingly be traded over the Internet.
- Private estimates suggest that ESD amounts to 1-2 per cent of overall industry revenues and up to 10 per cent of packaged software revenues. Among the reasons holding back the wider implementation of ESD are bandwidth limitations, consumers' love for the "look and feel" of the software box, and fears of on-line piracy.
- Various private estimates point to growing use of ESD. By the year 2000 up to 50 per cent of packaged software may be downloaded directly from the Internet and electronic sales may represent about 5 per cent of the total world-wide software market.
- Even if the use of ESD is limited, its potential in the rapidly growing area of international transactions may be significant. Among the major distributors of software over the Internet, those with international customers seem to export more than one-third of their products.
- A crude "back of the envelope" calculation shows that US revenues from international electronic delivery of software could amount to 6 per cent of overall US software export revenues.
- Concerns about piracy, bandwidth problems, restrictions on and costs of international transactions are holding back international ESD. New technologies, together with trade liberalisation and harmonisation of regulations will contribute to the development of electronic software delivery.

Selected policy issues related to trade in digitised products

Across-the-border electronic commerce involving goods will continue to face custom duties and value added tax. The main challenge to fiscal and custom authorities will come from supplies of on-line activities. Tariffs on computer software do not seem to constitute a significant trade barrier, and the proposed "standstill" (no new tariffs for electronically traded products would simply ensure maintenance of the positive *status quo* situation. The crucial issue for international trade in on-line activities is the elimination of international differences in regulatory barriers affecting access to electronic markets.

The implications of electronic commerce for collecting conventional income and sales taxes are also significant, but the possibility of raising substantial revenues by taxing international Internet transactions is very low owing to the geographical mobility of the potential “Internet tax payer”. Moreover, electronic transactions are difficult to monitor, and international electronic transactions might be technically impossible to trace, although it may be possible to develop technology for auditing international transactions of some digital products.

Countries are also becoming increasingly aware of copyright concerns related to the Internet and are beginning to modify their copyright laws to reflect electronic transmission and storage of digital work such as software. The Internet, as a naturally global contestable market, is creating pressure and momentum for trade liberalisation and international harmonisation of regulations.

INTRODUCTION

The Internet will affect practices of measuring and thinking about trade in at least two ways. The first has to do with geographical boundaries: “In this age of the Internet, geography and location mean little. Servers can be located in multiple locations and can be run by multiple companies.”² The second refers to the blurring of the distinction between tangibles and intangibles.

Most countries’ value added taxation (VAT) systems distinguish between goods and services, which are also covered by different trade agreements, the GATT and the GATS, respectively. Yet, newspapers, software packages, and CDs can now be converted into bits and delivered electronically, and the same will be true for other goods in the future. The growth of electronic commerce will probably require a re-evaluation of how certain transactions are classified.

While international electronic ordering of goods will continue to be subject to custom duties and VAT, the main challenge to tax and custom authorities will come from activities supplied on-line.³ Therefore, this paper focuses not on electronic commerce as a service or as a market – a place for retailing, marketing, or conducting payments electronically (“cyber commerce”) – but on electronic delivery of products and services that are digital in nature or can rapidly be digitised. It tries to quantify the potential importance of a mode of supply that offers an alternative to traditional across-the-border delivery of goods and services.

Available sources and statistics are used to try to measure the extent to which international transactions are or could become “digital”, and to describe the most important measures affecting electronic trade in packaged software, the product with the highest share and greatest growth potential in the electronic market. In terms of relevant measures, the focus is on those that are particularly relevant for international transactions of digital products, and that are regulatory in nature. Section I defines the “bit economy” and gives an overview of the size and dynamics of the market for packaged software. Section II focuses on the international dimension of the software market and deals with the hurdles of measuring software trade. Section III tries to give a notion of the size of ESD, the best-selling on-line product and one that will be increasingly traded over the Internet. Section IV illustrates the potential of electronic distribution for international transactions in digital products. Section V analyses some policy issues related to electronic software delivery and therefore to trade in electronic products. Finally, section VI presents some concluding remarks.

I. The digital economy

In the United States, Asia and Europe, some 52 million people are now connected to the World Wide Web⁴. The “bit economy”, that part of the economy that earns its revenues directly from the Internet, comprises not only services such as advertising, entertainment, financial services, and computer services, but also what may be defined as “digital” industries.⁵ These include newspapers, periodicals, book publishing, radio and television broadcasting, music, computer software – all those goods/services which can potentially be turned into bits. These industries are also among the core copyright industries, i.e.

those industries that primarily create copyrighted works or produce copyrighted materials.⁶ The “digital” industry is not yet specifically covered in the statistics. To obtain a rough idea of its size, Table 1 uses statistics from the US core copyright industries as a proxy.⁷

Table 1. Core copyright industries (CII) in the United States, 1994

US\$ billions

Value added	\$254.6 billion
Share of GDP	3.78%
CCI, 1987-94 GDP annual average growth	5.80%
Rest of the economy, 1987-94 GDP annual average growth	2.30%
Employment	\$3.1 million
Employment in the CCI, 1987-94 annual average growth	4.00%
Employment in the rest of the economy, 1987-94 annual average growth	1.60%
Estimated revenues generated by foreign sales of selected US CCI (*)	\$48.33 billion
(*) Recorded music, motion pictures, TV, video, computer software, newspapers, books, periodicals.	

In 1994, the core copyright industry produced 40 per cent more value added than the chemical industry (the highest US value-added manufacturing industry in that year), and it is certainly a growing industry. To estimate the extent to which “digital” industry revenues are generated over the Internet, Table 2 estimates on-line revenues for books, music and computer software. The reported estimates are sectoral averages; in the case of books, it is worth noticing that Amazon, the pioneer in Internet bookselling with an annual revenue of about \$64 million, offers over 2.5 million titles and is one of the most visited sites on the Web.⁸ It was not possible to find direct estimates of software on-line sales, hence some back-of-the-envelope calculations were performed. In 1996, computer software ranked third among US sectors in on-line retailing activity, with a total revenue of \$90 million, after automobiles (\$250 million) and travel (\$150 million).⁹ Forrester Research forecasts that computer products (including hardware) will be the fastest growing category for on-line shopping ((Table 3) and PC Meter indicates software sites as being top shopping sites (February 1996). As leading PC vendors’ on-line sales are estimated to reach 10 per cent of their total revenues and on-line users’ have a similar propensity to purchase software and hardware (16 per cent and 13 per cent, respectively, see Table 4), it is assumed here that a 10 per cent estimate can be applied to computer software. Estimates of electronic distribution of software range from 10 per cent of the packaged software market in 1997 (IDC) to 40-50 per cent of the market by the year 2000.

Table 2. Estimates of on-line revenues as a percentage of total revenues

Books	<i>ranging from 1% to 8% (in 2000)</i>
Music	<i>7.5% (in 2002)</i>
Computer software	<i>10%, 40-50% (in 2000)</i>

Source : www.cyberatlas.com , www.e-land.com

Table 3. Projected on-line shopping revenues by category, 1996-2000

Percentage

	1996	1997	1998	1999	2000
Computer products	27%	28%	30%	31%	32%
Travel	24%	24%	24%	24%	24%
Entertainment	16%	17%	18%	18%	19%
Apparel	9%	8%	7%	6%	5%
Gifts&flowers	9%	9%	9%	10%	10%
Food and drink	8%	7%	6%	6%	5%
Other	7%	7%	6%	6%	5%
Total	100%	100%	100%	100%	100%

*Source: Forrester Research, 1997***Table 4. On-line purchases for various categories**

Category	% of users who have purchased
Software	16.0%
Books	14.0%
Computer Hardware	13.0%
Music	11.0%
Home Electronics	6.5%
Videos	5.0%
Travel Services	5.0%
Tickets for events	4.0%
Casual clothes	3.0%
Other clothes	1.5%

Source: University of Michigan Business School

Even if the available data is poor, evidence on software on-line sales, together with data on the growing and globalising market for packaged software, can be used to measure the extent to which international transactions are or could become “digital”. The following paragraphs give a brief overview of the size and dynamics of the packaged software market.

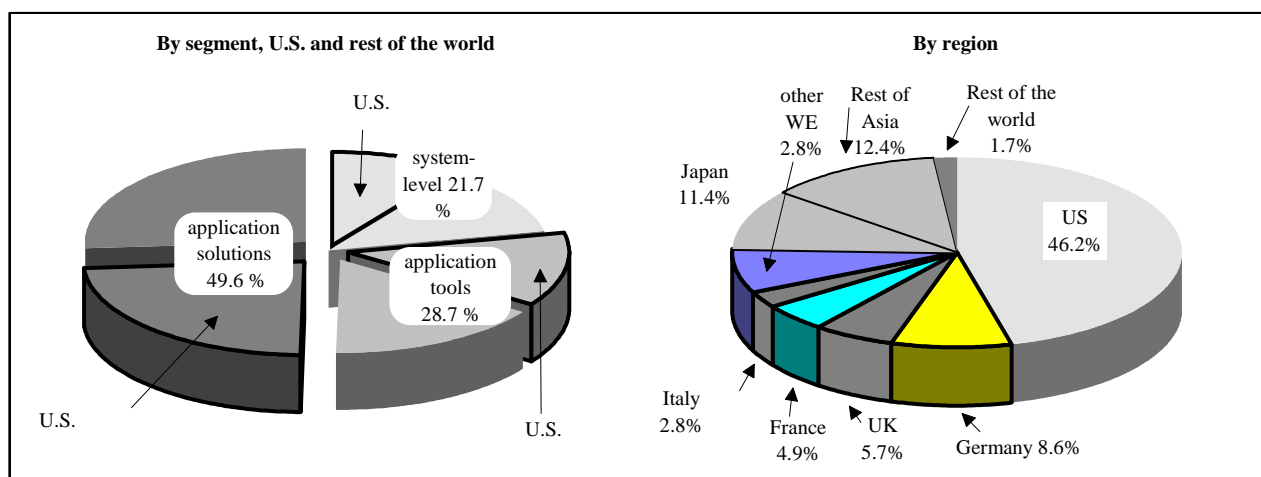
The growing market for packaged software¹⁰

Pre-packaged software is the most dynamic segment of the core software industry (computer programming services, pre-packaged software and integrated system design).¹¹ This segment includes systems software, application tools and application solutions (Figure 1). It was worth \$109.3 billion in 1996 and is estimated to double to \$221.9 billion by 2002.¹² The lead products are applications solutions – programmes that perform specific industry or business functions – and the leading country is the United

States with 46 per cent of the world market (\$50.4 billion).¹³ In terms of market dynamics, Canada, France, Germany and Japan have shown above OECD average growth rates over the last nine years (Figure 2), and Germany is now estimated to represent 8.6 per cent of the world packaged software market.

Figure 1. Packaged software world-wide market, 1996

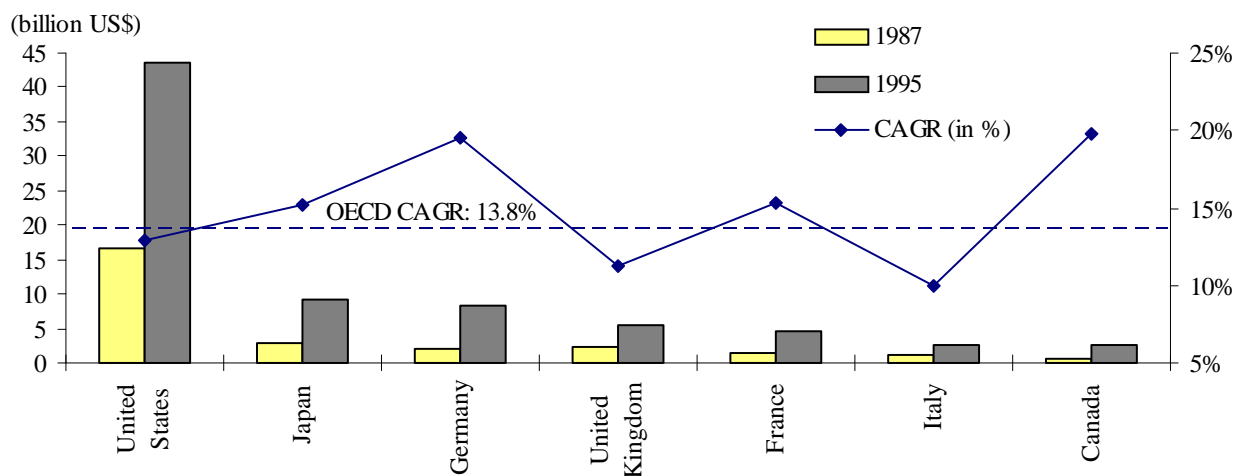
World-wide market = \$ 109.3 billions



Source: IDC, quoted in *US Industry and Trade Outlook 1998*, US Department of Commerce.

Figure 2. Packaged software markets, 1987-95

G7 countries



Source: IDC and OECD; CAGR = compound annual growth rate

II. Measuring software trade: a gap in the statistics

“We all know what they say about statistics. Much of the data concerning the size and rate of growth of high-tech markets is, to put it politely, optimistic. Often, the groups publishing the figures have a vested interest in providing a positive view of a particular market segment. In other cases, industry studies use statistics selectively to prove a point.” (Financial Times, 19 November 1997). Even if private sector statistics have to be interpreted with caution, national statistics may be lacking or unreliable. This is especially the case of official statistics for trade in software.

Tracking imports and exports of software in trade statistics is fraught with measurement problems. For example, if a company sells a software application and manuals abroad directly, the operation can be recorded as exports of goods.¹⁴ If it sells them to a computer company which loads them on its computers before export, they will be included in the value of the computers that are exported. If instead a copy of the software is sold to a foreign firm which pays royalties to make further use of it, this operation will appear in the Balance of Payments as an export of business services. To complicate the matter further, if a company opens a branch abroad, the income accruing from software sales will be recorded as the income of the branch and will be a component in its profits. When these are remitted to the home country, they will appear in the Balance of Payments as “investment income”.¹⁵

It would be a daunting exercise to attempt to estimate how much software value is bundled in trade of personal computers. Every personal computer bought in the United States and exported would include an average value “x” of software. Given the number of PCs exported every year, it is clear that the mismeasurement due to “bundled” software is huge. Even when software is sold directly abroad and captured in customs data, there remains the problem of differing records in declaring (importing and exporting) countries. Also, and more importantly, valuation at the border is often based on the medium (diskettes, CD-ROMs) rather than on the content (software); moreover, the methodology may not be consistent over time, shipments and countries.

Using 1994 data for Japan’s trade in software with the United States, Table 5 gives an example of the measurement problem. The first two rows correspond to imports and exports of diskettes, CD-ROMs, and other media containing software¹⁶ as reported by the declaring country and contained in the OECD FTS database. While Japan declared that it imported from the United States \$216.8 million worth of software, the United States declared that it exported \$303.2 million worth to Japan. The figures in the third row are based on the same classification of software and custom valuation but come from different databases (different source). According to one source, the United States exported to Japan \$303.2 million of software, but \$261 million according to another. The fourth row provides software trade statistics from a Japanese survey (content versus value of the medium); imports of diskettes and CDs seem to underestimate the value of Japanese software imports from the United States by almost 1 000 per cent.

Table 5. The measure problem: Japan-US trade in software, 1994

Definition	Declaring country	Imports (million US\$\$)	Exports (million US\$\$)	Source
Imports and exports of software ¹	Japan	216.8	33.8	OECD, FTS database, Harmonised System Classification, Rev. 2 ²
Imports and exports of software. Imports correspond to US exports to Japan.	US	209.8	37.7	OECD, FTS database, Harmonised System Classification, Rev. 2 ³
Software products from the US trade balance in advanced technology products. Imports correspond to US exports to Japan.	US	261.0	26.0	US Bureau of the Census, based on Harmonised System Classification data.
Statistical survey on software trade. Game software excluded.	Japan	2 436.2	18.2	JEIDA, JISA, JPCSA
<p>1. Lines 852431, 852440, 852491, and 852499 of the Harmonised System Classification, Rev.2</p> <p>2. 1994 estimates based on the 1996 share of the lines defined above within the larger category of exports.</p> <p>3. 1994 US estimates based on the corresponding Japanese 1996 share of software within the 4-digit category, applied to US 1994 4-digit category.</p>				

Source: OECD.

This highlights another mismeasurement problem. Export statistics not only underestimate the value of the software contained in the medium, they also fail to measure more generally the value of copyrighted works sold in foreign markets. When a master version of a copyright work, “the gold master”, valued at few hundred dollars in the United States, is shipped to a foreign market, copies may generate millions of dollars in sales or license fees.

Despite the difficulty of finding meaningful data on software exports, it is possible to derive some sense of the importance of the US software industry as an “exporter” by looking at foreign sales by vendors of pre-packaged software, as these give a good approximation of the overall market. In 1994, US vendors’ sales accounted for at least 75 per cent of the world market, about 90 per cent of the US market, 63 per cent of the European, and 55 per cent of the Japanese market.¹⁷ Table 6 reports total sales by US pre-packaged software vendors and the part of their revenues originating in foreign markets.¹⁸ US export revenues amount to almost half of total revenues. Given that estimated US vendors’ sales amounted to 90 per cent of the US market, if the value of the revenues of US vendors in 1994 (in 1994\$) is increased by 10 per cent, foreign sales (which correspond roughly to 50 per cent) would amount to \$11.33 billion. Table 7, instead, which reports software export statistics from the US trade balance in advanced technology products, indicates that total US exports of software products in 1994 were only \$3.03 billion.

Table 6. Total and non-US sales of US leading independent pre-packaged software vendors

	Total Software sales	Non-US Software sales	Per cent non-US sales
1987	6.8	2.9	42.3%
1989	9.8	4.4	44.6%
1990	12.2	5.6	45.8%
1991	13.7	6.6	48.0%
1992	16.1	7.8	48.2%
1993	18.6	8.9	48.1%
1994	22.6	10.6	46.9%
1995	28.7	12.9	45.2%

Source: OECD Secretariat, based on data from Economist Incorporated.

Table 7. Share of selected OECD countries in US software product trade, 1990-96

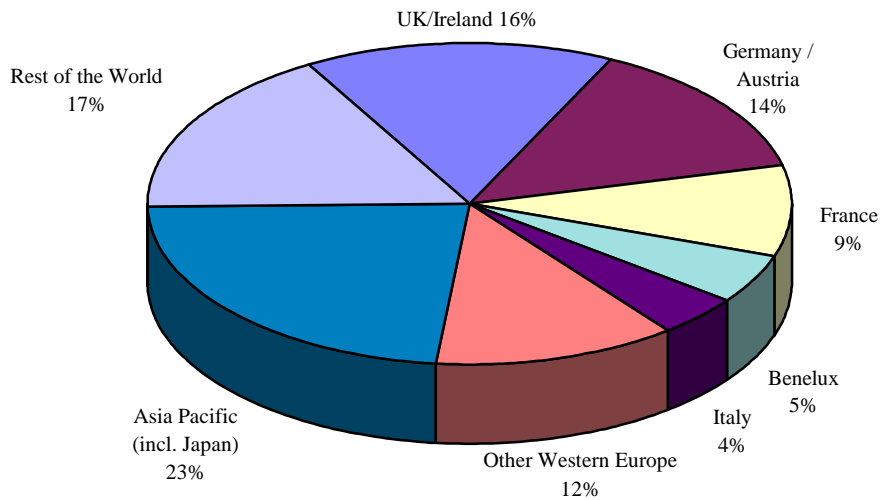
	Exports							Imports							Trade balance							
	1990	1991	1992	1993	1994	1995	1996	1990	1991	1992	1993	1994	1995	1996	1990	1991	1992	1993	1994	1995	1996	
World Total (million of US\$)	1 328	1 625	2 050	2 526	3 031	3 058	2 618	157	196	295	360	436	560	588	1 171	1 429	1 755	2 166	2 594	2 498	2 030	
Share of world total (percentage)																						
Canada	33.0	30.6	28.1	26.9	27.3	28.3	25.1	35.5	34.9	36.8	30.1	26.8	23.9	29.0	32.6	30.0	26.7	26.4	27.4	29.3	24.0	
Mexico	1.3	1.5	1.9	2.3	3.4	1.8	2.3	1.6	2.0	1.2	1.5	0.7	0.5	0.8	1.2	1.5	2.0	2.5	3.9	2.1	2.8	
Germany	8.3	8.7	10.4	10.3	8.4	6.7	5.5	5.5	6.2	7.4	4.6	5.3	7.1	6.7	8.7	9.1	11.0	11.2	9.0	6.6	5.1	
France	4.6	4.5	4.3	3.8	3.7	3.4	2.8	4.7	2.7	2.3	3.8	3.1	2.7	2.4	4.6	4.8	4.7	3.8	3.8	3.6	2.9	
Italy	2.7	1.8	1.9	1.5	1.7	1.8	2.1	0.6	0.3	0.4	0.5	0.7	0.9	0.6	2.9	2.1	2.1	1.7	1.8	2.1	2.5	
United Kingdom	10.6	9.5	9.5	9.2	8.2	7.1	6.8	8.1	10.1	8.9	10.1	7.1	6.2	6.2	10.9	9.4	9.6	9.0	8.4	7.2	7.0	
Japan	10.7	10.5	8.7	8.1	8.6	11.0	14.7	14.1	16.0	9.7	7.1	6.0	5.4	4.2	10.2	9.7	8.5	8.3	9.1	12.3	17.7	
Rep. of Korea	1.9	2.0	1.9	2.6	2.8	3.0	3.6	1.4	1.3	0.7	0.6	0.3	0.2	0.6	2.0	2.1	2.1	2.9	3.3	3.6	4.5	
Hungary	0.2	0.3	0.3	0.4	0.4	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.3	0.3	0.5	0.5	0.4	-1.9	
Poland	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.2	

Source: US trade in advanced technology products, *Science & Engineering Indicators 1996*, from Census Bureau, US Dep. of Commerce unpublished tabulations, and data from US Dep. of Commerce.

Figure 3 shows the 1996 breakdown of US software vendors' international revenues by region, according to private sources.¹⁹ Western Europe, and particularly France, Germany and the United Kingdom, are the most important markets for US pre-packaged software. These figures can be compared to US national software export statistics as reported in Table 7. Especially striking is the difference between the percentage of US software exports to Canada in 1996 (25 per cent) according to trade balance statistics and data from private sources (where Canada is included in the "rest of the world").

Figure 3. US packaged software revenues from international markets, 1996

Breakdown by region, percentage of non US revenues



Source: OECD Secretariat, based on *US Industry and Trade Outlook 1998*, US Department of Commerce, and SPA data.

Canadian software companies also have a high propensity to export. Table 8 lists those firms among the top Canadian 100 independent software companies whose income originates entirely from software sales and shows their foreign revenues from licensees. A median value of 90 per cent of revenue comes from foreign sales. Over the years, export sales have generated an increasing proportion of revenues (see the last two columns in Table 8), and expansion in international markets has been crucial to the success of Canadian software companies.²⁰

Table 8. The top Canadian software firms and their propensity to export

Rank 1996	Rank 1994	Company	Business specialties	Total revenue 1996 (\$000)	Revenue export 1996 (%)	Revenue export 1994 (%)
1	1	Corel Corp. , Ottawa	Productivity, graphics and multimedia software	454 512	95	93
2	2	Cognos Inc. , Ottawa	Application development & business-intelligence tools	207 567	90	88
4	7	Hummingbird Communications , North York, ON	Enterprise internetworking software & document distribution solutions	102 100	96	95
10	11	Solcorp , Mississauga, ON	Life insurance administration	30 500	60	
15	-	SoftArc Inc. , Markham, ON	E-mail & work-group collaboration software	20 000	90	
17	20	Simware Inc. , Ottawa	Internet info-access & network automation software	17 658	90	90
25	64	Open Text Corp. , Waterloo, ON	Intranet-application software	13 600	90	85
33	41	GIRO Enterprises , Montreal	Routing & scheduling software	9 100	85	80
36	-	ObjecTime Ltd. , Kanata, ON	Object-oriented tools for real-time applications	8 800	85	
39	-	ACL Software , Vancouver	Data analysis, audit and reporting software	8 150	99	

Source: Branham200 Software Companies

III. Measuring electronic software delivery

Software is the best on-line seller

Estimates of on-line shopping vary according to sources and definitions of shopping (surfing to shop, actual purchase, off-line or on-line, or strictly on-line purchase). In every case, however, software is the top category for on-line shopping (see Table 4), and computer products (both hardware and software) are projected to be the fastest growing category (see Table 3). On-line transactions of software are mainly business-to-business. In contrast, business-to-consumer transactions seem to be growing less quickly. The reasons are both technical (it is not possible to download gigabits of software to consumers with 28.8 modems) and practical (problems with on-line payment systems).

The electronic distribution revolution?

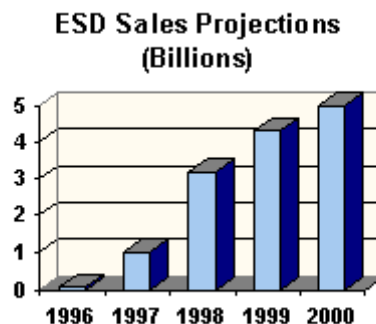
In addition to the traditional modes of supply (across-the-border trade, bundled in hardware, trade through commercial presence), software products can now be converted into bits and shipped directly over the Internet. This trend, the so-called electronic software distribution (ESD) revolution (see Box 1), will increasingly reorient domestic and international transactions from already hard to measure physical transactions to intangible electronic exchanges. Among the top ten Web software shopping sites

(PC Meter, February 1996), the first five are dedicated to the distribution of freeware and shareware programmes. Three of the others provide software delivery over the Internet directly from the manufacturer (buydirect.com, egghead.com, 32bit.com). Among the reasons holding back wider implementation of ESD are bandwidth limitations, consumers' love for the "look and feel" of the software box, and fears of on-line piracy.

Respondents to the Softletter Survey (see below), all of whom use ESD to some extent, represent a cross-section of the software industry in terms of company size and software application category. Among the smaller resellers surveyed by CRN (Computer Reseller News), only 15 per cent used ESD in the July-September 1997 period, and only 24 per cent of those not using it were planning to do so in the future. However, Cisco Systems Inc., which expects 30 per cent (\$2 billion) of its total sales to be generated over the Internet, does not buy or receive software on-line.²¹

Although a few major companies rely on ESD,²² electronic sales probably still only amount to a very small percentage of overall industry revenues (1-2 per cent according to Softletter). Online Interactive, for example, uses only ESD and offers 2 900 software titles from more than 270 publishers. Software.net revenues from both pure and hybrid ESD (on-line ordering plus mail delivery) are over \$1 million a month. Most major retailers, like CompUSA and Wal-Mart, still use on-line ordering only. Based on the data, or the lack of them, it is difficult to believe in an electronic distribution revolution. Various private estimates nonetheless point to growth in the use of ESD (Figure 4):

- 10 per cent of packaged software in 1997 (International Data Corporation)
- 33 per cent of packaged software by 1998 (Softletter)
- 40-50 per cent of packaged software by 2000 (Forrester)
- \$4.6 billion (5 per cent of a \$91 billion market) by 2000 (International Data Corporation)
- 11 million PC users in the US routinely download software from the Internet (IntelliQuest²³)
- Software is the #1 seller on the Web (Netsales)
- ESD software purchases, excluding licensing, are expected to reach \$5 billions by 2000 (Netsales)



Source: <http://www.netsales.net/nsesd.html>

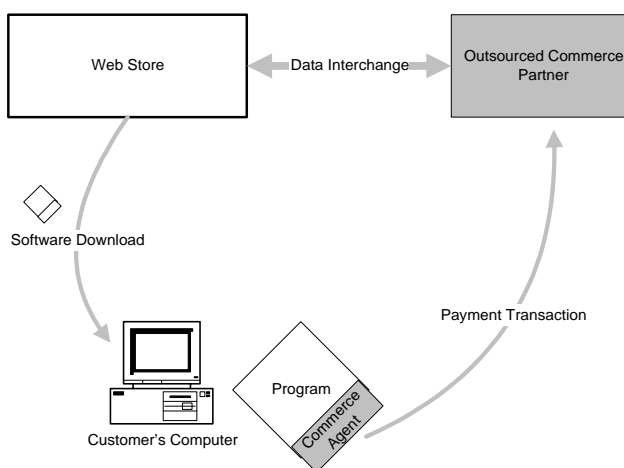
A 1996 survey by Softletter covering 310 PC software developers and publishers who use ESD showed unanimity that ESD would reach a “critical mass”, defined as 33 per cent of revenues, very soon (with 1998 as the median date). According to the survey, ESD is mainly used for indirect marketing (distribution of demos, trials and shareware versions) but expected future applications will mainly involve direct electronic delivery. Speciality software distributors (such as those dealing with education, accounting, Unix, scientific or technical software) seem particularly ready to embrace ESD.²⁴ These distributors focus on higher-margin, lower-volume sales that often entail more support.

Who are the ESD customers? The largest deal so far on the ESD market has been the US Defence Logistics Agency’s five-year, \$50 million commitment in July 1997 to purchase Microsoft Corporation software electronically through Software.net²⁵. Software packages, upgrades, and updates of Microsoft products are to be delivered electronically to up to 70 000 federal employees a year. The expected savings in packaging, shipping, installation, and maintenance costs for the five-year period are estimated at over \$30 million.²⁶ Given the potential savings in procurement and administration costs, the use of ESD by public administration certainly has great potential.

Box 1. What is ESD?

There are two ways to deliver software from a Web store. One is on-line ordering: customers order the product over the Web, but it is shipped through the traditional mail system. The other is electronic software distribution (ESD): customers download software via their Internet connection. In this system, the publisher provides a software master to its partners. Before the user downloads the software, a secure electronic version of the software must be packaged in a “digital wrapper” (envelope) either by the publisher, by the channel partner, or by a clearinghouse which audits sales. The package cannot be unlocked and installed until the clearinghouse has approved customer payment and sent the customer a key to unlock the package. In place of the traditional proof of purchase (a hologram sticker on the cardboard box, a UPC code, or an original installation disk), customers receive an electronic certificate, referred to as an End-user Licence Agreement (EULA).

This technology allows Web stores to outsource their e-commerce infrastructure instead of building it in-house and makes it possible to separate the transaction from the act of downloading the software. Basically, the Web store delivers a software programme with an additional piece of technology, called the “commerce agent” or “ESD wrapper” (see figure below). This also allows for a pay-after-download system (the customer only pays after successfully downloading or after having tried the software - try-before-you-buy software). The commercial agent is responsible for all transaction processing and for developing technology that enables the software to be delivered securely over the Internet.



Source: adapted from Release Software Corporation, 1997, and Software Publishers Association, 1996.

IV. ESD and the potential for international transactions

The Internet is helping to create a single global market for software by cutting through many of the distribution and marketing barriers that can prevent firms from gaining access to foreign markets. VDOnet and CheckPoint, two Israeli firms that make a video software and a security software, respectively, are two of the hotter Internet companies.²⁷ Another noticeable trend is the growing participation of non-US firms. International Data Corporation (IDC) estimates that by the year 2001 nearly half of all Web users will be located outside the United States.²⁸ Among the top 20 world software suppliers, five are non-US (Table 9). Particularly spectacular is the case of the German SAP, one of the

fastest-growing firms in the industry, which now ranks fifth in the world-wide packaged market. These trends, together with data on companies' foreign sales, point to the increasing globalisation of the software market. ESD, which can reduce the cost of transactions, could facilitate this process and contribute to increased trade in software.

While a FutureScapes survey (Activmedia Company) reports that on-line companies are three times as likely to export as off-line companies, there seem to be no data on the extent to which ESD is used in international transactions. By surfing the Internet sites of companies that provide ESD, it is possible to collect information on whether software can be electronically delivered to international customers. Of the three top software shopping sites that provide ESD, buydirect.com and egghead.com (through Release Software Corp., see below) deliver internationally while 32bit.com (working with NetSales, see below) does not.

Table 10 gives information on ESD for two of the biggest Internet-based software stores, one which offers a pure ESD model (Online Interactive) and one which offers mixed distribution with both ESD and simple on-line ordering (software.net), and for two of the most important technology and ESD services providers (NetSales and Release Software Corporation). Online Interactive, which only sells electronically, does not yet deliver internationally, owing to taxation issues, currency conversion costs, high fraud rates, and cultural differences, while software.net (whose revenues from ESD and mixed distribution amount to more than \$1 million per month) reports that over one-third of its transactions are with customers outside North America.²⁹ Presumably, this applies to total revenues rather than to pure ESD revenues. Both ESD services providers deliver internationally. NetSales does not take responsibility for customs and taxes. NetSales, whose ESD sales to non-US customers amount to more than one-third of total revenues, finds restrictions on international transactions in software the most significant barrier to international electronic distribution. Release Software Corporation offers sales tax calculations, fraud screening and export control management.

Table 9. Top 20 software companies world-wide, 1990 and 1996

		Software Revenue (million current US\$)			
		World packaged software market share	World 1996	% North America 1996	World 1990
IBM	US	11.9%	13 052.0	NA	9 842.6
Microsoft Corp.	US	9.0%	9 247.0 ^f	30.5	1 289.9
Hitachi Ltd.	Japan		3 960.0 ^f	NA	956.3
Computer Associates International Inc.	US	3.8%	3 945.0	57.0	978.2
Oracle Corp.	US	3.1%	3 615.0	50.3	695.8
Fujitsu Ltd.	Japan		2 000.0	NA	1 820.8
SAP AG	Germany	1.7%	1 692.0	NA	190.4
Bull NH Information Systems Inc.	France		1 457.8	NA	600.6
Digital Equipment Corp.	US		1 224.9 ^f	NA	1 529.4
Novell Inc.	US	1.1%	1 208.0	55.6	433.1
Siemens Nixdorf	Germany	1.1%	1 020.0	NA	933.3
Sybase Inc.	US		1 011.5	61.0	76.7
Sun Microsystems Inc.	US		1 000.0 ^f	NA	137.9
Informix Software Inc.	US		823.7 ^f	36.1	146.1
Hewlett-Packard Co.	US	2.1%	798.5 ^e	NA	442.3
Adobe Systems Inc.	US		786.6	66.9	303.7
SAS Institute Inc.	US		620.4	51.2	240.2
Unisys Corp.	US		600.0	NA	758.3
Parametric Technology Corp.	US		596.3	43.1	52.4
Cadence Design Systems	US		587.0	48.6	322.0

Source : OECD, compiled from various sources; e = all estimated revenue.

By combining the average estimates of on-line software sales reported in Table 2 with all the above information, it is possible to obtain a “back of the envelope”, very crude calculation of potential Internet trade in digital products (at 1995 trade levels). It is assumed that international on-line delivery of digital products occurs at the same rate as total on-line delivery. In this case, by applying a factor of 10 per cent (see Table 2) of the estimated trade revenues, one obtains a value of \$2.91 billion (Table 11). A rough estimate of the revenue obtained from international delivery of software can also be calculated by combining revenue estimates indicating: (a) the propensity to distribute software on-line internationally; (b) the propensity to deliver software on-line; and (c) the propensity to export software³⁰. Companies selling software over the Internet report earning more than a third of their revenue from international transactions (see above), i.e. they export at least 33 per cent of their software. Data on US software vendors show that US export revenues amount to almost half of total software revenues (see above). Using values of 33, 10 and 50 per cent for (a), (b) and (c), respectively, one obtains an estimated share of exports of electronically delivered software of 6.6 per cent of total software exports. Applying the 6.6 per cent share to estimated trade revenues, one obtains a value of \$1.92 billion is obtained (Table 11). These very crude estimates show that international on-line delivery of digital products mainly consists of trade in computer software.

Table 10. Examples of international electronic software distribution

	% of ESD sales on total sales/no. of titles offered/no. of virtual stores operated/No. of distribution agreements/product size	International delivery	Duties and customs	Barriers to the development of international ESD
Online Interactive/ atOnce Software (http://www.online-interactive.com) electronic software reseller of MicroWarehouse	100% ESD sales 2,900 titles >10 stores >350 agreements <25 MBs	No, because of taxes, currency, high fraud rates, cultural differences		(1) fraud (2) bandwidth limitations (3) security/privacy (4) restrictions on international transactions (5) customers' attitude
Software.net (http://www.software.net) first Internet-based software superstore	>3 000 titles >100 agreements	Over 1/3 of the transactions are with customers outside North America. Restrictions by manufacturers, US export control restrictions	Customer is responsible for all customs, tariff, taxes	
NetSales (http://www.netsales.net) ESD technology and services providers	More than 2/3 ESD sales >20 resellers	Between 1/3 and 2/3 of ESD sales come from international customers. Restrictions by manufacturers, U.S. export control restrictions	Customer is responsible for all customs, tariff, taxes	(1) restrictions on international transactions (2) bandwidth limitations (3) security/privacy (4) customers' attitude (5) localisation (currency, language) costs
Release Software Corporation (http://www.releasesoft.com) ESD technology and software provider	>150 companies >100 outlets	Yes, agent recognised by the US Dept. of Commerce Export is possible even with strong 1024-bit RSA transaction security	Offers sales tax calculation and collection services, fraud screening and export control management	
<i>Source</i> : The World Wide Web; e-mail survey.				

Table 11. Estimated international trade in US digital products over the Internet

Industry	1995 estimated revenues generated by US foreign sales (US \$ billions)	Factor applied	Estimated international trade over the Internet (US \$ billions)
computer software	29.14	6.6% and 10%	1.92 and 2.91
recorded music	9.90	7.5%	0.74
newspapers, books, periodicals	3.95	4%	0.16

Source: Internet and Economist Incorporated 1996, and OECD.

Companies that export electronically face the same restrictions as for physical delivery of software: embargoes or restrictions by publishers or manufacturers.³¹ Some companies may face export restrictions on certain products designed to meet military specifications and/or used in military applications (such as products which are considered “dual-use goods” which contain cryptographic mechanisms). However, some exceptions allow the development of exportable products. For cryptography applications, the US Department of Commerce grants exemption licenses on a case-by-case basis, allowing companies to export certain software which includes cryptographic mechanisms for strong transaction security. The Release Software Corporation has been granted such a licence.

V. Selected policies affecting electronic trade in software

“Paradoxically, Internet commerce requires both openness and privacy, as well as ubiquitous access and security.”³² Barriers to the use and development of electronic commerce have been analysed at length in various fora. Issues of security, authentication, certification, consumer protection, access to infrastructure, and bandwidth limitations are relevant to electronic transactions in general (whether domestic or international) and may be adequately tackled through the development of new technologies and self-regulation. This paper focuses more narrowly on barriers that are particularly relevant for international transactions of digital products, particularly computer software, and that are more regulatory in nature. It discusses duties, taxes, and export restrictions on international trade in software and international differences in copyright protection. Finally, and because of the blurring distinction between tangibles and intangibles, it is argued that the crucial issue for international trade in on-line activities is not so much to establish an Internet tariff-free zone as it is to eliminate international barriers to market access. In the absence of data on such barriers, the example of software is used to establish a very simple framework for evaluating countries’ differences in regulatory barriers affecting electronic markets.

Tariffs and taxes on computer software

It has been argued that the Internet should be declared a tariff-free zone.³³ This would imply that whenever goods are ordered electronically, and delivered physically, no import duties should be added to those that already cover physical transactions, and that no new import duties on electronic transactions should be created. Basically, trade policy should not discriminate between the use of electronic and other traditional modes of supply, so as not to create an additional barrier to the development of electronic

commerce. While this proposal does not have implications for products that will continue to be physically traded, the main challenge to custom authorities will come from purely on-line supply of digital products.

In fact, for computer software, the proposed tariff-free zone is in practice tariff-revenue neutral and consistent with current laws. This is because tariffs on computer software are generally applied on the value of the floppy disk or tape (media) rather than on the full market value of the software (content). Moreover, tariffs on the media, at least in OECD countries, are zero or will be soon phased out³⁴ (Table 12). Applying low or no duties to a tariff base that is very difficult to measure (see Section II) makes potential losses in import revenues due to the substitution of physical software transactions by electronic transactions hard to quantify or, at best, negligible. Nevertheless, even if tariffs on computer software do not seem to constitute a significant trade barrier in OECD countries, the proposed “standstill” (no new tariffs for electronically traded products) would maintain the positive *status quo*.

Instead, the challenge of electronic commerce to tax authorities is certainly the crucial one. It will not be discussed at length here.³⁵ It is the decentralised structure of the Internet that presents a significant challenge for tax collection. The Internet has no physical location, users have no knowledge of the path followed by the information they send, and intermediaries offer interconnectivity but do not have control over the information flow. It is difficult in any case to monitor electronic transactions, and because of the weak correspondence between domain names and the “real world”, international electronic transactions may be impossible to trace. The Internet address identifies the person responsible for the domain name but not the actual computer or the location of the machine. A person located in country A can run a business in country B through a computer located in country C by using remote control programmes configured so as not to leave an audit trail.³⁶ However, new technologies may provide solutions to some of these problems. For example, “digital signatures” can make it possible to verify identities and “digital notarisation” can provide some guarantees about the integrity of electronic records.³⁷

Transactions involving digitised products, such as computer software, books, music or images, also pose the problem of defining income.³⁸ The purchase of software can give the right to a single copy of the programme or the right to reproduce a limited or unlimited amount of copies. Depending on the case, the transaction may be viewed as equivalent to a physical transaction and hence generate income from sales of goods or it may create royalty income.³⁹ Digitised information may also further complicate the definition of service income, and therefore tax collection, since the definition for tax purposes of foreign-based company sales may differ from that of foreign-based company services income (e.g. in the United States). International software sales are treated as income from royalties and are subject to foreign income tax laws, while value added tax (VAT) is applied to the cost plus the insurance and freight (CIF) value of the good inclusive of the tariff duty. Table 12 gives examples of OECD-area VAT regimes applied to products in the 85.24 tariff line of the Harmonised System Classification.

Table 12. Tariffs and taxes applied to computer software in the OECD

Tariff line 85.24 of the Harmonised System

	Tariff on software			Tariff on manuals	W/holding taxes	Other taxes
	M	C	U			
Canada	0-1.3%			0	exempt	7% goods and services tax + a provincial sales tax, if applicable
Australia	0.05			0	0.1	22% goods and services tax
Austria	0			0	exempt	20% VAT
Belgium	0			0	exempt	21% VAT
Czech Republic	1.4-2.3% ¹			0	0.1	22% VAT; 20% import deposit required on HS 8524
Denmark	0			0	exempt	22% VAT
Finland	0			0	exempt	20% VAT
France	0			0	0.05	20.6% VAT
Germany	0			0	exempt	15% VAT
Greece	0			0	exempt	18% VAT
Hungary	9.1% ²			0	exempt	25% VAT; 1% customs fee
Iceland	0.1			0	exempt	24.5% VAT
Ireland	0			0	exempt	21% VAT
Italy	0			0	0.1	19% VAT
Japan	0			0	0.1	5% consumption tax
Luxembourg	0			0	exempt	15% VAT
Netherlands	0			0	exempt	17.5% VAT
New Zealand	0			0	0.1	12.5% goods and services tax
Norway	0			0	exempt	23% VAT
Poland	14-14.7%			0	0.1	22% VAT
Portugal	0			0	unknown	17% VAT
Spain	0			0	exempt	16% VAT
Sweden	0			0	exempt	25% VAT
Switzerland	specific duty			0	exempt	6.5% software, 2.0% manuals
Turkey	3.6-4.1% ³			0	exempt	15% VAT
United Kingdom	0			0	exempt	17.5% VAT

M=media, C=content, U=uncertain

(1) the value of the media and the full content value must be broken down on the invoice

(2) 8.8% for magnetic tape with a width greater than 6.5mm

(3) the tariff rate for HS 8524.40.99.00 is 4.5%; the tariff rate for HS 8524.39.00 is 4.1%.

Software that falls in categories 8524.40.10 and 8524.01.10 is exempt.

Source : US Department of Commerce , International Trade Administration , Office of Computers

(http://infoserv2.ita.doc.gov/ocbe), updated August 21, 1997

Hence, although the implications of electronic commerce for conventional income and sales tax collection are significant, the likelihood of raising substantial revenues by taxing international Internet transactions is very low due to the geographical mobility of the potential “Internet tax payer”. Technology may be developed to audit transactions of some digital products, particularly computer software. Technologies which are being developed to solve some of the problems typically associated with ESD, such as limited bandwidth and security concerns, may also help tax authorities to audit digital transactions. An example is the SmartShelf turn-key system by means of which software, instead of being distributed over the Internet, is stored directly on the client server.⁴⁰ The customer can place an order, and once authorised to do so, can decrypt and install applications by using an electronic key. This method allows the management of entire virtual libraries without the need for physical shelf space. It allows a 120-megabyte application to be installed in six minutes, rather than the 15 hours it would take to download using a 28.8 modem. This has raised the issue of nexus and fears of tax liabilities.⁴¹ “The problem with it is there’s a thing in our world called nexus. If you have a physical presence at a customer’s site, than you have nexus and you could be potentially liable for taxes in whatever state the customer is. That would frighten us away from it.”⁴²

Export controls

Key to the development of electronic transactions is the security and integrity of electronic communications and files. Cryptography technology can help to ensure security by using mathematical formulas to scramble the data so that only authorised recipients, who hold the code to unscramble the data, have access to the information.⁴³ This process can be used in reverse as a kind of “digital signature” to provide assurances about the integrity of data and the identity of the sender. There are several kinds of cryptography and the longer the key length, which measures software’s encoding capabilities, the more secure the programme. These cryptography technologies have been, and are being, used to transmit encrypted information of a sensitive nature, such as information for military purposes. More importantly, cryptography technologies are used in a large range of software programmes (e.g. for financial transactions) to provide mechanisms for authentication, integrity, and non-repudiation of data.⁴⁴ The increasing importance of information security for electronic transactions might clash with controls on exports of cryptography software.

Copyright protection

A strong global intellectual property framework is essential to developing and promoting electronic commerce. Intellectual property rights (IPR) is an issue of particular relevance for digitised products, since firms cannot appropriate much of the benefit of product innovation without some form of legal protection. The more than 800 CEOs and senior executives surveyed by the Software Publishers Association (SPA) identified Internet intellectual property protection and software piracy as their top concerns for the software industry.⁴⁵ According to Business Software Alliance (BSA) estimates, the software industry loses more than \$11.2 billion annually world-wide (or \$355 per second) due to loss of IPR.⁴⁶

The World Trade Organisation Agreement on Trade-related Aspects of Intellectual Property Protection (TRIPS) sets minimum international standards for intellectual property protection.⁴⁷ Differences in the implementation of the Agreement, as well as differences in national intellectual property policy, will affect industries’ trade competitiveness. Copyright mostly protects the literal expression of the software code. “Look and feel” copyright protects the more generalised features of the

programme's user interface or operation, such as the menu structure, screen icons and the like. Patent law, however, protects the general inventive concept specified in patent claims, such as methods for performing certain software functions or operations⁴⁸.

Table 13 gives an overview of IPR regimes, as applied to software, together with BSA and SPA estimates of "piracy rates". While the regimes apply generally to software, countries are becoming increasingly aware of copyright concerns related to the Internet and are beginning to modify their copyright laws to cover electronic transmission and storage of digital literary work, such as software, music, and audio-visual material, on the Internet⁴⁹. Two recent international treaties negotiated by the World Intellectual Property Organisation (WIPO) extend many of basic rights of copyright holders to information, images, music, and software residing on the Internet.⁵⁰

Table 13. Intellectual property regimes for protection of software in selected OECD countries

Jurisdiction	Key laws and regulations	Protection afforded	Comments	Piracy rate (*) (1996)
Australia	Copyright Act (1968), as amended (1984)	Computer software is explicitly protected as literary works	Exclusive rights of reproduction, diffusion and adaptation	32%
Canada	Copyright Amendment Act (1989 and 1994)	Computer software is explicitly protected as literary works	Exclusive rights of reproduction and adaptation; distribution rights are not as extensive as in the United States	42%
European Union	Directive 91/250 on the Legal Protection of Computer Programs (EU Software Directive) Directive on Harmonisation of Copyright Term (1993) National laws implementing the above directive	Computer software is explicitly protected as literary works	Exclusive rights of reproduction, distribution (including rental), and adaptation; decompilation is permitted only to determine interoperability	Austria: 43% Belgium: 39% Denmark: 35% Finland: 41% France: 44% Germany: 36% Greece: 78% Ireland: 70% Italy: 55% Netherlands: 53 Portugal: 53% Spain: 65% Sweden: 47% U.K.: 34%
Japan	Copyright Act (1970), as amended (1985 and 1993)	Computer programs are explicitly protected but not as literary works	Exclusive rights of reproduction, distribution, rental, and adaptation; programming languages, syntax and algorithms are not copyrightable; courts have ruled that the object code is copyrightable and that reverse engineering is not allowed	41%
Republic of Korea	Computer Program Protection Act (1987), as amended (1993)	Computer programs are explicitly protected	Exclusive rights of reproduction, distribution, rental, and adaptation; programming languages, program rules and program solutions used in programming are not copyrightable; computer programs are patentable	70%
Mexico	Copyright Law, as amended (1991 and 1995)	Computer software is explicitly protected as literary works	Exclusive rights of reproduction, distribution, rental and adaptation	67%
New Zealand	Copyright Act (1962), as amended (1994)	Computer software is explicitly protected as literary works	Computer programs are not patentable	35%
United States	Computer Software Copyright Act U.S. patent laws (Title 35 of U.S. Code) Section 337 of the Tariff Act of 1930 (19 U.S.C. 1377) as amended by section 1342 of the Omnibus Trade and Competitiveness Act of 1988	Computer programs (source and object code) and original databases are explicitly protected as literary works	Exclusive rights of reproduction, distribution (include lease and rental) and adaptation; protection for "look and feel" has been permitted by some low federal courts. Patent laws protect inventive elements of software	27%
<p>Source: US ITC (1995), U.S. Office of Computers and Business Equipment (updated September 1997), BSA/SPA 1997 Piracy Report for "piracy rates" figures. (*) The difference between software applications installed and software applications legally shipped equals the estimate of software applications pirated. The piracy rate was defined as the amount of software pirated as a % of total software installed.</p>				

Market access

Tariff barriers do not seem to be an issue for software or other digitised products. More relevant for these products, as well as for other on-line traded activities (mainly services such as travel and banking) are barriers to international market access. In the case of electronic markets, and to the extent that demand plays a major role in the development of markets for new goods and services, it is crucial to focus not only on barriers to service provision (electronic delivery by the supplier) but also on measures affecting consumers' access to the market (Internet user or buyer).

In the case of computer software, a very simple framework can be used to evaluate international differences in regulatory regimes that might affect market access from the perspective both of the supplier and the consumer. For this framework, described in detail in “Assessing barriers to trade in services” (TD/TC/WP(97)26), it is crucial to obtain information through questionnaires and construct an inventory of the measures affecting market access and then rank them with the aid of a flowchart.⁵¹ Because it is not known in advance whether barriers to access to electronic markets exist for software or other digital products, a first step would be to consider which regulatory measures may affect electronic software delivery (service provision) and/or consumer’s access to the market. An idea of the type of information needed can be obtained by looking at Internet and electronic commerce agreements (see Box 2). Although these are clearly contractual agreements and are not regulatory in nature, they provide guidance on relevant issues for market access from a “business” perspective. In particular, agreements on on-line access (user’s perspective), as well as those related to software distribution (provider’s perspective), should be looked at. An example of how the issues addressed in these agreements might be used to gather relevant regulatory information is provided below.

Online access: the user’s perspective

Key issues in on-line access agreements involve the nature of the services to be provided, the right of the service provider to restrict access and to claim ownership of proprietary rights to the uploaded content, as well as the user’s rights to on-line privacy.⁵² Some issues in the checklist developed by the SPA to guide software contracting provide a useful overview of measures affecting users’ access to ESD. These issues concern access and license and the information needed relates to the delivery of the digital product and to restrictions on product content.

- Is the user granted access to the provider’s system?
- If so, to what extent is the access provided full access or access through a special software?
- If access is provided through a special software, can the user be licensed to use that software?
- If the licence can be provided, are there limitations on it? Can the access be extended to members’ of user’s business or household?
- Once the product is delivered, are there limits on the user’s use of the product content?

Software distribution: the supplier’s perspective

The electronic software distribution agreement between the supplier and the on-line distributor is similar to traditional software distribution agreements but also addresses issues of specific concern to on-line distribution, such as security, privacy, and compliance with issues related to international distribution (e.g. regulations on transborder data flows and export controls on encrypted products). Online market access to a software distributor is granted by licence. Relevant information to be obtained includes:

- Are there restrictions on the form of the licence to be granted (exclusive or non-exclusive, transferable or non-transferable, world-wide or restricted to a specific territory)

- Are there restrictions on software marketing (both for business-to-consumer and business-to-business relations)?
- What rights are granted to the distributor? (Right to install the software on a server, to offer, distribute and transmit it, etc.)

Box 2. A typology of Internet and e-commerce agreements

Online access agreement

Designed for use by a provider of on-line services, it covers the nature of the service to be provided, the right of the service provider to restrict access, to change its operating procedures, or to modify the rules of access for the on-line service. Where users may upload information to the service, the service provider will also address issues of ownership of proprietary rights and editorial control over the uploaded content, and the user's rights of privacy in electronic communications.

Web site notices and disclaimers

An operator has virtually no control over who views its Web Site. This often raises a number of legal concerns for Web site operators. They can post notices and disclaimers in an attempt to protect themselves.

Electronic software distribution agreement

Used by the owner of a software product to authorise a distributor to provide software on line. Distributors must ensure that the end-user accepts the terms of the agreement before downloading the software. Distributors should also maintain the software on a secure server and must comply with exports laws and restrictions where applicable.

Certification authority subscriber application agreement

Used by a party providing certification services to those who wish to use a digital signature to facilitate on-line communication and transaction. A certification authority verifies the identity of a subscriber, issues a certificate linking the person to a particular public key, and publishes the certificate, which can be checked by those who want to verify a digitally signed electronic communication.

Web wrap agreement

Agreement requiring a party to manifest its assent by hitting a key or clicking an on-screen button. It is especially designed for use in the context of the on-line sale of goods.

Internet advertising sponsorship agreement

Designed for use by the operator of an highly trafficked Web site which desires to permit another party to place advertisements on that Web site for the other party's goods, services or information.

Web link agreement

Designed for use by the operator of an highly trafficked Web site and another party who wishes to take advantage of that traffic to attract visitors to its Web site. The owner of the highly trafficked site agrees to include an image incorporating the Uniform Resource Locator (URL) for the less trafficked site.

Source: adapted from SPA (1996).

By gathering regulatory information along these lines, it would be possible to compile an inventory of the measures affecting access to electronic software delivery. The inventory could then be used to construct a synthetic indicator which would allow for evaluating differences in countries' regulatory barriers affecting electronic markets.

VI. Concluding remarks

This paper looks at international trade in software in order to analyse the impact of the Internet on practices of measuring and thinking about trade. Services flows, such as financial or travel services, are an important share of Internet transactions; therefore, an alternative and more quantitatively relevant approach would involve looking at the implications of electronic commerce for trade in services. The measurement of trade in services, as delivered through the traditional modes of supply, raises so many additional issues that it would be difficult to distinguish the impact of the use of electronic means on trade flows.⁵³ In looking at software, one can isolate the “Internet effect” and the measurement and policy issues raised.

Software is a “digital” product, and while international statistics do not yet cover the “digital” industry, US data suggest that it is important in size and growing rapidly. Given that there are no estimates of on-line trade in software, some rather daring assumptions are made to give a rough indication of the size of US electronic trade in digital products. Even if the numbers are rough and ready, they can be used, together with other evidence on software transactions over the Internet, to conclude that software is a digital product that will be increasingly traded over the Internet.

Although it is difficult to find meaningful data on software exports, foreign sales of pre-packaged software by vendors show that the software industry has a high propensity to export and that the software market, traditionally dominated by the United States, is becoming more global. Electronic distribution of software over the Internet may help create a single global market for software.

On the basis of the data, or the lack thereof, it is difficult to believe in an electronic software distribution revolution. Various private estimates point, however, to growing use of ESD. Even if ESD is still small, its potential, in terms of rapidly growing international transactions, may be significant. Among the major distributors of software over the Internet, those that work with international customers carry out more than a third of their total electronic transactions with them. Where software is not delivered internationally, it is usually due to concerns of piracy, problems of bandwidth limitations, or restrictions on international transactions.

Some policy issues related to trade in digitised products are raised using the example of software. Electronic commerce presents a crucial challenge to tax authorities, since, in practical terms, international electronic transactions may be technically impossible to trace. Although the implications of electronic commerce for conventional income and sales tax collection are significant, the likelihood of raising substantial revenues by taxing international Internet transactions is very low, owing to the geographical mobility of the potential “Internet tax payer”.

Tariffs on computer software do not seem to constitute a significant trade barrier and, in this respect, the proposed “standstill” (no new tariffs for electronically traded products) would simply maintain the *status quo*. A crucial issue for international trade in on-line activities is to eliminate international differences in regulatory barriers which affect access to electronic markets. In the absence of data on such barriers, a simple methodology for collecting such information and thereby evaluate international differences in regulatory regimes which might affect market access is proposed. Finally, as countries become increasingly aware of copyright concerns related to the Internet, they are beginning to modify their copyright laws to reflect electronic transmission and storage of digital work, such as software. The Internet, as a naturally global and competitive market, is creating pressures for and momentum in trade liberalisation and international harmonisation of regulations.

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NOTES

¹ See OECD (1997c).

² Release Software Corporation, 1997.

³ See OECD (1997b).

⁴ Forrester Research (1997).

⁵ According to Forrester Research \$11 billion of financial assets are managed online and the figure is expected to increase to nearly \$500 billion by the year 2000; 34% of banks are now offering some form of online banking and 45% are actively developing it; estimates for the travelling industry range from 20-25% to 33% of total online revenues.

⁶ As defined by the International Intellectual Property Alliance.

⁷ These core industries, in addition to the ones that have been defined as digital industries, comprise cable television, motion pictures, theatre production.

⁸ See Morgan Stanley (1997).

⁹ Source: Robertson, Stephens & Co., reported in e-mmerce (<http://www.computerworld.com/emmerce/depts/stats/>).

¹⁰ The definition of “packaged” software market might differ depending on the source of the data. US Census Bureau or Software Publisher Association (SPA) data underestimate the packaged software market by not including client/server, operating systems, mainframe or groupware software. IDC data, instead, include all package software applications, comprising system software and utilities, application tools and application solutions. It is also important to note that US Census Bureau figures for pre-packaged software do not include revenues from companies that supply both computer hardware and software. Census figures miss revenues of major world-wide software suppliers such as IBM, Digital, Sun Microsystems and Hewlett-Packard.

¹¹ For a definition and available statistics of the broader Software and Services industry see OECD (1997).

¹² US Department of Commerce estimates (US Industry and Trade Outlook, 1998).

¹³ International Data Corporation, from data quoted in the US Industry and Trade Outlook, 1998.

¹⁴ In the United States, trade data is collected from the filing of Shipper’s Export Declaration (SED). Companies shipping products that total under \$2500 are not required to fill out a SED, hence those transactions would not be recorded as export of goods.

¹⁵ See the UN report “the economic and social situation in the world: 1996, p.266-7.

¹⁶ Lines 852431, 852440, 852491 and 852499 of the HS-- Harmonised System -- product classification.

¹⁷ Siwek and Mikkelsen (1994).

18 Data in Table 4 only include part of the packaged software market and excludes operating systems, mainframes, groupware and client/server software. These data might, therefore, underestimate total and non-US sales of software.

19 Total revenues are based on IDC data, while the breakdown by region is based on SPA data. See footnote 11 for a definition of the segments such data include.

20 *TechWatch*, The Financial Post Magazine, March 1997.

21 Economist, 1997, quoted in http://www.e-land.com/e-stat_page/ec_ex.html.

22 E.g. McAfee, Netscape and Xoom Software, which lets any software to be downloaded at \$29.95 annual subscription. (PCweek, April 7, 1997).

21 Cited in PC Magazine, December 16, 1997.

24 See Computer Reseller News, July 14, 1997, Issue: 745.

25 Software.net is a large Internet-based superstore with over 21,000 software titles of which more than 2,200 are directly downloadable over the Internet. Even if only one per cent of the inventory is electronically delivered, currently 24 percent of their sales comes from ESD. And over 1/3 of their transactions are with customers from outside North America. (<http://www.software.net/dist.htm>)

26 <http://www.software.net/press/970701.htm>.

27 The Economist, "The Software Industry Survey", May 25th, 1996.

28 <http://www.zdnet.com/products/ecommerceuser/intro.htm>

29 <http://www.software.net/dist.htm>.

30 To estimate the share of export revenues from electronically distributed software on total export software revenues (X_E/X), the following formula is applied: $X_E/X = (X_E/Y_E) * (Y_E/Y) * (Y/X)$, where Y=total software revenues and X=revenues generated by foreign sales. The subscript "E" indicates revenues generated by sale of software distributed over the Internet. The estimated share (X_E/X) is then multiplied by the 1995 estimated volume of revenues from US foreign sales (X). The estimate of export revenues from electronic distribution of software (X_E) is thus obtained.

31 A list of manufacturer who often restrict the export of their products is given by netsales (<http://.netsales.net/pk.wcgi/benchin/international>): Acius, Aladdin, Aldus, Altsys, Adobe, Amtex, Apple, Asd Software, Ashton-Tate, Automap, Berkeley Systems, Borland, Broderbund/Maxis, Brown-Wagh, Caere, Central-Point, Claris, CMS, Colorado Spectrum, Connectix, Corel Systems, Dataease, Datawatch, Dayna, Delrina, Deneba, Digital Research, Diva, Equilibrium, Foresight, Frametechnology, FWB, GDT Technology, Global Village, Graphsoft, Gryphon, Hayes, Inline Design, Hewlett-Packard, IBM, In-Line, Insignia, Intuit, Iomega, Kent-Marsh, Lotus, Lucas Arts, Macplay, Magna, Microsoft, Microtek, Microcom, Newer Technology, Now, Paracomp, Practical Peripherals, Quak, Quarterdeck, Software Marketing, Silicon-Beach, Sitka/Tops, Sportster, Supra, Symantec, The Learningcompany, Traveling-Software, TGS Systems, US Robotics, Virtus Zoom.

32 "Internet Economics", 1997, p.445.

33 See the joint EU-US statement on electronic commerce (5 December 1997).

³⁴ With the Information Technology Agreement (ITA), signed on March 26, 1997, 40 governments have agreed to phase out by January 2000 all tariffs on computers, software (contained in diskettes, magnetic tapes, CD-ROMs, etc...), telecoms products and semiconductors. They account for 92.5% of world trade in Information Technology products. (<http://www.wto.org/wto/new/press70.htm>).

³⁵ For a thorough discussion see “ Electronic Commerce: the Challenges to Tax Authorities and Taxpayers” background paper prepared by DAFPE for the Turku conference on “Dismantling the Barriers to Global Electronic Commerce” held on November 18, 1997.

³⁶ See “Selected Tax Policy Implications of Electronic Commerce”, Department of the Treasury Office of Tax Policy, November 1996.

³⁷ See OECD (1997b).

³⁸ To tackle this problem the U.S. proposed regulation on computer programme transactions treats the mode of supply (physical or electronic) as irrelevant and concentrates, instead, on copyright law analysis. The objective is to determine whether the rights obtained by a licensee are copyright rights or are substantially equivalent to the rights that would have been obtained had the transferee acquired a programme copy. (U.S. Department of Treasury, 1996, p.28).

³⁹ Information that can be digitized is usually protected by copyright law. Payments received for the use of copyrights are considered royalties.

⁴⁰ For a description of this technology see:
<http://devworld.apple.com/mkt/informed/appledirections/aug96/smartshef.htm> and
<http://www.bitsource.com/description.htm>.

⁴¹ <http://www.bitsource.com/description.htm>.

⁴² Quoted in “Computer Reseller News”, November 1997, Issue 765.

⁴³ USITC (1995).

⁴⁴ *Authentication* means a function for establishing the validity of a claimed identity of a user, device or another entity in an information or communications system. *Integrity* means the property that data or information has not been modified or altered in an unauthorised manner. *Non-repudiation* means a property achieved through cryptographic methods, which prevents an individual or entity from denying having performed a particular action related to data (such as mechanisms for non-rejection of authority (origin); for proof of obligation, intent or commitment; or for proof of ownership). OECD (1997d).

⁴⁵ SPA Testimony on the Online Copyright Liability Limitation Act (Sept. 16, 1997).

⁴⁶ Business Software Alliance Statistics (<http://www.bsa.org/piracy/diduknow.htm>)

⁴⁷ The TRIPS Agreement, signed in January 1995, protects computer programmes (both source and object code) as literary works; databases are protected as compilations. The TRIPS is due to be reviewed in 2000.

⁴⁸ See David C. Mowery, p. 275, in Merger ed., (1996)..

⁴⁹ For a discussion on this issue see “Risk Management and the World Wide Web” (in <http://infoserv2.ita.doc.gov/ocbe/>).

⁵⁰ The “WIPO Copyright Treaty” and the “WIPO Performances and Phonograms Treaty”, both adopted on December 20, 1996.

⁵¹ The general framework developed to assess barriers to trade in services and illustrated in TD/TC/WP(97)26 can also be used to assess barriers to the development of electronic delivery of software and of other digital products.

⁵² Software Publishers Association (SPA), 1996.

⁵³ The four modes of supply are: cross-border supply, consumption abroad, commercial presence, and presence of natural persons.