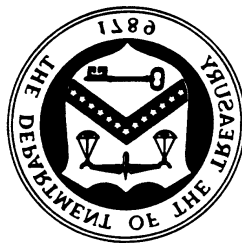


Selected Tax Policy Implications
of
Global Electronic Commerce



Department of the Treasury
Office of Tax Policy

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This paper provides an introduction to certain federal income tax policy and administration issues presented by developments in communications technology and electronic commerce. This paper is a discussion document, designed to elicit views on the issues presented as well as suggestions as to solutions for new problems. This paper is neither intended, nor should be taken as an expression of the legal or policy views of the United States Government, including the Department of the Treasury and the Internal Revenue Service. In addition, no inference is intended as to current law.

Unless otherwise indicated, all section references are to the Internal Revenue Code of 1986, as amended (the "Code").

This paper has also been posted on the Treasury Department's home page on the World Wide Web at <http://www.ustreas.gov>.

Comments on any of the issues raised by this paper should be addressed to: Joseph H. Guttentag, International Tax Counsel, Department of the Treasury, 1500 Pennsylvania Avenue, NW., Washington, D.C. 20220. Comments may also be submitted to Treasury via Internet e-mail to TAXPOLICY@treas.sprint.com, with the subject line "technology issues." All comments will be available for public inspection and copying.

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EXECUTIVE SUMMARY

New information and communications technologies such as the Internet are creating exciting opportunities for workers, consumers, and businesses. Information, services, and money may now be instantaneously transferred anywhere in the world. Firms are increasing their imports and exports of goods, services, and information as the costs associated with participating in global markets plummet, and they are forming closer relationships with suppliers and customers around the world. New markets and market mechanisms are emerging. Consumers can choose from a much broader range of goods and services, and “intelligent agent” software will soon give consumers an unprecedented ability to hunt for bargains.

These new technologies, particularly communications technologies including the Internet, have effectively eliminated national borders on the information highway. As a result, cross-border transactions may run the risk that countries will claim inconsistent taxing jurisdictions, and that taxpayers will be subject to quixotic taxation. If these technologies are to achieve their maximum potential, rules that provide certainty and prevent double taxation are required.

In order to ensure that these new technologies not be impeded, the development of substantive tax policy and administration in this area should be guided by the principle of neutrality. Neutrality rejects the imposition of new or additional taxes on electronic transactions and instead simply requires that the tax system treat similar income equally, regardless of whether it is earned through electronic means or through existing channels of commerce.

A major substantive issue raised by these new technologies is identifying the country or countries which have the jurisdiction to tax such income. It is necessary to clarify how existing concepts apply to persons engaged in electronic commerce. In addition, transactions in cyberspace will likely accelerate the current trend to de-emphasize traditional concepts of source-based taxation, increasing the importance of residence-based taxation.

Another major category of issues involve the classification of income arising from transactions in digitized information, such as computer programs, books, music, or images. The distinction between royalty, sale of goods, and services income must be refined in light of the ease of transmitting and reproducing digitized information.

In the area of tax administration and compliance, electronic commerce may create new variations on old issues as well as new categories of issues. The major compliance issue posed by electronic commerce is the extent to which electronic money is analogous to cash and thus creates the potential for anonymous and untraceable transactions. Another significant category of issues involves identifying parties to communications and transactions utilizing these new technologies and verifying records when transactions are conducted electronically. However, developments in the science of encryption and related technologies may lead to systems that verify the identity of persons online and ensure the veracity of electronic documents.

Treasury invites comments on the issues raised by this paper as well as any other issues relating to electronic commerce.

Comments should be addressed to Joseph H. Guttentag, International Tax Counsel, Department of the Treasury, 1500 Pennsylvania Avenue, NW., Washington, D.C. 20220. Comments may also be submitted via Internet e-mail to TAXPOLICY@treas.sprint.com, with the subject line “technology issues.” All comments will be available for public inspection and copying.

1. INTRODUCTION

It is by now a well-worn cliché to say that we live in an era of rapid technological and social change. Technologies and businesses that were unknown a few years ago are now widespread. Most recently, the explosive growth of telecommunications technology, sometimes referred to as the “Global Information Infrastructure,” or the “Information Superhighway” which includes the Internet, has enabled people to communicate and exchange information on an unprecedented scale. These technologies present tremendous opportunities to enrich all of our lives in so many ways, many of which we are likely not to have envisioned. As President Clinton has said, “The day is coming when every home will be connected to it, and it will be just as normal a part of our life as a telephone and a television. It’s becoming our new town square, changing the way we relate to one another, the way we send mail, the way we hear news, the way we play.”

These new technologies bring with them social changes and new ways of doing business. Services are an ever-growing sector of the economy. Modern telecommunications allow information, services, and money to be instantaneously transferred anywhere in the world. Some have even speculated that the traditional corporation could itself become obsolete in certain cases as “virtual corporations” bring together varying groups of consultants and independent contractors on a project-by-project basis.

These technological advances may put particular pressure on the principles governing the taxation of transnational transactions. It is the very nature of these developments that they tend to blur national borders and the source and character of income. Consequently, significant issues often arise regarding how the income arising from transnational transactions utilizing these technologies should be treated under current rules. As a result, it is possible that countries will claim inconsistent taxing jurisdiction, with the attendant possibility that taxpayers will be subject to international double taxation. If these technologies are to achieve their maximum potential, this must be avoided. Our overall tax policy goal in this area should emulate policy in other areas — maintain neutrality, fairness and simplicity — a policy which serves to encourage all desirable economic activity new and old.

These technological developments dictate that the Internal Revenue Code and generally accepted principles of international tax policy be reexamined.¹ It is in all parties’ interests to study the potential issues now, seek public comment, and develop rules that accommodate evolving technologies and ways of doing business.

¹This paper is limited to federal income taxation issues. These technological developments also raise other issues, such as the effect on subfederal taxation, which are outside the scope of this paper. Nevertheless, Treasury believes that these new technologies should not be used to justify new taxes. Accordingly, Treasury is not considering any type of value added tax (VAT), “bit tax,” or other new excise tax on electronic commerce.

This paper is meant to be a step in this process of reexamination. It is neither a treatise on taxation of technology nor a blueprint for future changes. Instead, the purpose of this paper is to stimulate public discussion by raising issues that currently exist or seem likely to arise. This paper is intended to encourage interested taxpayers, practitioners, academics, and others to comment on the issues identified herein and other similar tax issues that they believe require resolution.

The modernization process of which this paper is an early step will proceed on many fronts. Some of the issues identified in this paper can be resolved through the administrative process. It is possible that other issues can be resolved only through amendments to the Internal Revenue Code. Treasury will work with the Ways and Means Committee, the Finance Committee, and the Joint Committee on Taxation to study the statutory changes that may be required. Finally, it may also be necessary to reach an international consensus on certain issues. Treasury will be involved with the work of groups such as the Organization for Economic Cooperation and Development and with our treaty partners, to establish international standards to deal with these emerging issues.

Treasury intends that the goal of this process is to develop a framework for analysis that will not impede electronic commerce. The solutions that emerge should be sufficiently general and flexible in order to deal with developments in technology and ways of doing business that are currently unforeseen. In most cases, this will require that existing principles be adapted and reinterpreted in the context of developments in technology. In extreme cases, it may be necessary to develop new concepts.

The nature of the Global Information Infrastructure obviously has ramifications beyond taxation, including national security, copyright, privacy, security, financial trading systems, and even economic measurement. These issues are outside the scope of this paper, although the Office of Tax Policy and the Internal Revenue Service intend to coordinate their work with other branches of the Treasury Department and the United States government.

2. AN OVERVIEW OF THE GLOBAL INFORMATION INFRASTRUCTURE OR “INFORMATION SUPERHIGHWAY”

2.1. **The Information Superhighway.**² The Information Superhighway or Global Information Infrastructure is not a single computer network or means of communication but instead refers to the convergence of previously separate communications and computing systems into an interoperable, global network of networks.³ Eventually, this superhighway may transmit a wide spectrum of information, films, programs, and services into every business and household, incorporating voice telephony and cable television. This trend is driven in part by the fact that the cost of communications is falling quickly. The Information Superhighway permits its users to send and receive information around the world, at relatively low cost.

2.2. **Convergence of technologies.** The distinct communications systems that will converge to form the Information Superhighway include telephone systems, cable and satellite communications, and computer networks. This convergence has been in part driven by two major technological changes. In telecommunications, transmission has evolved from copper wire, which has a relatively limited data transmission capacity to fiber optic cable, which has virtually limitless capacity. This increased capacity makes it practical to rapidly transmit large amounts of information such as videos or x-rays. The second technological development is “digitization,” the conversion of text, sound, images, video and other content into a common digital format. Any type of information, including cash equivalents, which can be digitized can be transmitted electronically.

2.3. **Communications revolution is more than the Internet.** Although the Internet, which is discussed below, is the best known aspect of the communications revolution, the Internet is only an example of these developments. Many companies now operate extensive internal corporate networks, or “intranets,” and certain transactions, such as in the financial services sector, are likely to occur on private networks for security reasons. For tax considerations, it is generally immaterial whether parties communicate over the Internet or over a private, proprietary network, such as an online service or over an intra corporate network. It is also necessary to keep in mind that the communications revolution is the result of a number of technological and economic developments, such as relatively inexpensive computers and telecommunications services and the growth of the service sector.⁴ The growth of the service sector plays an important role because developments in communications allow services to be

2 The information contained in this paper, which is current as of November 1996, is only intended to provide a general summary. It does not purport to be a complete description of the new technologies.

3See generally, <http://nii.nist.gov>.

4In 1994, 74 percent of total U.S. employment was in the service sector, as compared to 67 percent in 1980.

instantaneously transmitted around the world. As a result, services frequently no longer need to be produced at the place where they are consumed. As developments in communications facilitate international trade in services, there may be increasing pressure on the international tax rules that apply to such services.

2.4. **The Internet.** The most widely publicized part of the information superhighway is the Internet. While originally a system connecting governmental and academic institutions, the Internet has expanded beyond its initial participants to a world-wide network with user estimates ranging from 30-60 million, and growing rapidly. The Internet has been described as

a world-wide network of networks with gateways linking organizations in North and South America, Europe, the Pacific Basin and other countriesThe organizations are administratively independent from one another. There is no central, worldwide, technical control point. Yet, working together, these organizations have created what to a user seems to be a virtual network that spans the globe.⁵

The Internet has no central computer or organizational structure. “Far from being a hub with spokes, the Internet is more like a spider’s web, with many ways of getting from point A to point B.”⁶ What links the Internet together and allows its many disparate parts to communicate is the “TCP/IP” protocol (Transmission Control Protocol/Internet Protocol), which is simply a means of specifying how data is broken up in “packets” and assigned addresses to be transferred over the Internet. It allows computers to communicate regardless of differences in hardware and software, or communications technology.⁷

Instead of a central computer, the Internet uses hundreds of thousands of computers called “routers.” Routers are like postal substations; they make decisions about how to route “packets” of data just like a postal substation decides how to route envelopes containing mail. Each router does not need a connection to every other one. Instead, packets of data are sent in the right general direction, using the best route available at the time, until they finally arrive at their destination. In fact, the individual packets making up a single message may end up taking different routes, to be recombined when they reach their destination.

The packets are transmitted over existing telephone networks. However, since the Internet is not tied to any communications technology, Internet traffic can also travel over cable TV systems, satellite links, or fiber optic cables.

5M. Meeker & C. Depuy, *The Internet Report* 1-9 (1996).

6Survey: The Internet, *The Economist*, July 1, 1995, at 6.

7*Id.*

3. THE WORLD WIDE WEB AND ELECTRONIC COMMERCE

3.1. Background

3.1.1. **The World Wide Web.** The World Wide Web (“WWW” or “Web”) is one of the fastest growing applications of the Internet.⁸ What distinguishes the Web from other components of the Internet is that it is a multimedia, hypertext system. Unlike other Internet services, the Web blends text, images, video and audio instead of displaying simple text. Web documents are hypertext documents that can contain links to other documents which can be accessed by “clicking” on these links. In fact, the links could be to any other “WWW” document on any Internet server anywhere in the world. Accessing the Web requires a browser program. The browser reads information accessed from the Web and presents it to the user in a standard format. Internet search tools allow users to locate Web pages containing the desired information.

3.1.2. **Web pages and Web sites.** A company’s or individual’s collected Web documents are usually referred to as a “Web site.” A uniform addressing system allows users around the world to access information on any Web site.⁹ The information is stored in the form of Web documents and pages on central computers called servers. The location of a server is irrelevant since it can be accessed by users around the world.

3.1.3. **Exponential growth of the Web.** Some indication of the speed at which the World Wide Web has developed is given by the fact that it was invented in 1989.¹⁰ Graphical browser programs, which made the Web easy to use and thus accessible to a wide audience, were only invented in 1993.¹¹ By 1996, it was estimated that there were over 250,000 commercial Web sites and a substantial number of major companies, and countless small ones, have invested on a presence on the Web.¹²

3.1.4. **Technical barriers.** Two factors that will be critical to the growth of electronic commerce are bandwidth and improved payment mechanisms. Bandwidth refers to the speed at which data can be transferred over the system. Currently, at the transfer speeds available

⁸At the end of 1995, the Web accounted for an estimated 40 percent of Internet traffic. G. Kessler, *Serving the Internet*, Lan Magazine, Sept. 1996, at 43.

⁹Web servers and Web browsers communicate using the HyperText Transfer Protocol, a special protocol created to transfer hypertext documents over the Web, which accounts for the ubiquitous “http” prefix in Web addresses.

¹⁰J. Markoff, *A Free and Simple Computer Link*, N.Y. Times, Dec. 8, 1993, at D1.

¹¹*Id.*

¹²K. DeBello, *Making Money on the Net*, Business Week, Sept. 23, 1996, at 104.

to most consumers, it would take about two days to transfer the entire contents of a music CD across the Internet. With higher speed connections likely to occur in a few years, transfer time is likely to be drastically reduced, to about 10-15 minutes. Payment is also of course a critical factor. There is an emerging consensus that electronic money (explained in Chapter 5 below) will accelerate the growth of electronic commerce. If payments can be made by a mouse click on an “electronic wallet” instead of transmitting credit card numbers, commerce is likely to grow.¹³

3.2. Electronic Commerce

3.2.1. **Generally.** “Electronic commerce is the ability to perform transactions involving the exchange of goods or services between two or more parties using electronic tools and techniques.”¹⁴ The growth of electronic commerce will be driven in part by the fact that two of the present economy’s important products are software and recorded entertainment (both films and music) which are particularly well suited to being distributed through computer networks.

3.2.2. **Retailing and wholesaling.** Web pages are now supplementing paper catalogs for many mail order companies and wholesalers. These Web pages are similar to pages from a paper catalog, displaying images of the goods and product information. Links to the vendor’s inventory control system can make it possible to verify whether the requested goods are in stock. For example, one such Web site is a bookseller that allows customers to search a database of over one million books, searching by either subject or name. It is open twenty-four hours a day and has customers in over 60 countries. This Web site does not merely allow customers to select and order books but also recommends related titles and will automatically notify customers when a desired book is published.

3.2.3. **Computer software.** Computer software, which is created and used in digital form, can be sold and delivered electronically. Software may be transferred directly from the seller’s computer to the purchaser’s computer without the need to deliver a floppy disk or CD-ROM. One such electronic software vendor allows customers to select software, which is transmitted and downloaded in encrypted format. Customers then enter credit card information, which is verified over a private network via a toll-free number. After authorization, a key that unlocks the software is sent to the customer. Alternatively, the cost of the software may be charged to a pre-existing account.

13Such developments appear to be on the horizon. *See e.g.* P. Lewis, *A Technology for the Cyber-Marketing Age*, N. Y. Times, Sept. 18, 1996, at D1; M. Jerome and W. Taylor, *Mint a Million*, PC/Computing, Oct. 1996, at 73.

14XIWT Cross-Industry Working Team, *Electronic Commerce in the NII*, at ¶1.0 (1995)(available at http://www.cnri.reston.va.us:3000/xiwt/documents/EComm_doc/ECommTOC2.htm); *See also*, <http://192.216.71/iw/center/hotweco.htm> (collection of links to other electronic commerce sites).

3.2.4. **Photographs.** Photographs can be purchased over the Internet, and customers can select varying rights to utilize the photograph. For example, stock photo agencies maintain large selections of photographs on a wide range of topics, which are licensed to publishers and advertising agencies who need a photograph on a given subject. Some stock photograph agencies have established Web sites which allow customers to purchase and download digitized images.

The price is based on the customer's intended use of the photograph.¹⁵ For example, one such arrangement involves five, successively more expensive categories, beginning with consumers who intended to make only personal use of an image, such as a student illustrating a term paper, and increasing to commercial customers who might want to distribute an unlimited number of copies.

3.2.5. **On-line information.** Electronic research databases are in widespread use. Services such as Lexis, Nexis, and Dialog have created vast computerized databases of reference information, such as legal materials or newspaper and magazine articles. Customers can access these databases and locate the desired information, which can be either read on-screen or printed. The distinction between on-line research services and books is now being blurred. Many publications, primarily reference works, are now being created and distributed in digital form, generally via CD-ROMs. In addition, once information has been digitized, it can also be transferred electronically. Some encyclopedias, for example, are now available either on CD-ROM or through an on-line service.¹⁶ With a sufficiently fast modem connection, a user might be indifferent as to whether she were accessing a CD-ROM on her desktop computer or a mainframe computer located at a distance. However, the latter, which can be easily and regularly updated, can make time-sensitive databases much more valuable than traditional "hard copies" or even CD-ROMs. In the future, the distinction between information stored on a desktop computer and information retrieved from a network will become increasingly blurred as desktop software adopts Web style interfaces which will seamlessly integrate desktop and Web functions.¹⁷

3.2.6. **Services.** Services will be a fast-growing area of electronic commerce. For example, at least one accounting firm is currently offering consulting services electronically. For a yearly fee, subscribers can obtain a password to visit the firm's Web site, where they can search a database of information and monitor relevant news. Subscribers can also submit questions, which are then routed to appropriate advisers from the firm's tax, accounting and management consulting divisions.

¹⁵As discussed in chapter 7.3 *infra*, a customer's intended use of the photograph may affect the classification, and thus the taxation, of the payment.

¹⁶Encyclopedias on CD-ROM. 32 into 1 will go, *The Economist*, Feb. 17, 1996, at R11.

¹⁷See e.g., S. Rupley, *Half Open or Half Closed*, *PC Magazine*, Dec. 3, 1996, at 28; A. Cortese, *The Software Revolution*, *Business Week*, Dec. 4, 1995, at 78.

3.2.7. **Health Care.** Health care is also an area in which services can be provided electronically.¹⁸ Fiber optic telephone links can now transmit high quality medical images to distant specialists in minutes. For example, at the Massachusetts General Hospital, “a team of 70 radiologists has X-rays wired from their own telemedicine center in Riyadh, Saudi Arabia.”¹⁹

3.2.8. **Videoconferencing.** Videoconferencing also creates expanded opportunities for distant persons to collaborate. Currently, videoconferencing is primarily used by large businesses because it requires expensive, dedicated equipment,²⁰ but it is becoming more widespread. For example, videoconferencing is being used by rural residents to obtain access to urban specialists.²¹ It is also being used by coaches to train athletes²² and by employers to interview job applicants.²³ Videoconferencing is expected to become more widespread with the introduction of inexpensive desktop video cameras that can be connected to a personal computer, coupled with higher speed Internet connections.²⁴

3.2.9. **Gambling.** Although Internet gambling may be illegal in the United States,²⁵ Internet casinos have been established offshore. These Internet casinos operate through Web sites which are virtual replicas of casinos offering electronic slot machines, black jack, poker and roulette.²⁶ Customers pay for their wagers either by credit card or by establishing an account with a bank associated with the casino and winnings are credited to either the credit card

18The Doctor Will See You Now — Just Not In Person, Business Week, Oct. 3, 1994, at 117.

19Id.

20B. Gates, *The Road Ahead* 149-50 (1995).

21*The Doctor Will See You Now*, *supra* note 18.

22See, F. Matheny, *Mail Order Coach*, *Bicycling*, Jan. 1996, at 50 (“Using only a telephone, a fax machine and perhaps a video camera, an isolated cyclist in Kansas can get personal coaching from a cycling guru in California.”)

23E. Wee, *Computers Give Firms a Window to College Prospects*, *The Washington Post*, Nov. 19, 1996, at B1.

24*The Road Ahead*, *supra* note 20, at 149-150, and 178-179. For a different perspective on videoconferencing, see C. Levin and S. Rupley, *Collaboration on Call*, *PC Magazine*, Sept. 10, 1996, at 31.

25See 18 U.S.C. §1084 (prohibiting transmission of wagering information and wagers by wire).

26See e.g., J. Sterngold, *A One-Armed Bandit Makes a House Call*, *N. Y. Times*, Oct. 28, 1996, at D1.

or bank account. In the future, gamblers will presumably be able to place their bets using electronic money.

3.2.10. **Stock trading.** Some stockbrokerages and mutual fund companies have Web sites which allow customers to trade securities electronically, including stocks, bonds, mutual funds, options, futures, and commodities.²⁷ Customers can access information regarding stock prices and company research and after researching the desired stock, an investor can enter an order on-line, specifying the stock, the number of shares and the price. Orders placed at the market price are routinely completed and confirmed in less than a minute. The trade is confirmed electronically and sometimes by mail as well. At present, trades are still settled conventionally, although electronic money could be used in the future. In addition to trading in the secondary market, securities are now being offered on-line.²⁸

3.2.11. **Global dealing.** “Global dealing” refers to the capacity of financial intermediaries, mainly banks and securities firms, to execute customers’ orders and to take proprietary positions in financial products in markets around the world and around the clock. For security reasons, global dealing is conducted over private networks, instead of the Internet, although as discussed above, the means of communication is not relevant for tax purposes. Global dealing is impossible without modern computer and communications technology, which allow orders to be transmitted around the world and a firm’s trading position to be continually transferred to locations where markets are open.

3.2.12. **Offshore banking and incorporation.** Some Web sites now offer offshore incorporation and banking services with the capacity for payment by credit card. Customers complete questionnaires on their computer, specifying the company name, desired jurisdiction, number of shares, etc. and this information is transmitted to a service company, which prepares and files the necessary forms. Although individuals and companies have always been able to create offshore corporations and open offshore bank accounts, these developments make it easier and less expensive to do so.

27Getting Wired, Barrons, May 6, 1996, at 37.

28L. Eaton, *Wall Street Without Walls*, N. Y. Times, Nov. 11, 1996, at A1; L. Eaton, *Initial Public Offerings, Coming Your Way over the Internet*, N.Y. Times, Oct. 23, 1996, at D10. This has obvious securities law implications which are outside the scope of this paper.

4. SECURITY AND ENCRYPTION

4.1. **Security requirements for an open system.** Security issues pose a particular problem for Internet commerce because the Internet is an “open” and inherently non-secure public system designed to facilitate information exchange.²⁹ Therefore, the security that is required for practical Internet commerce requires that security procedures be applied at the level of individual commercial transactions instead of being applied to the network as a whole. This involves the encryption of transmissions, which is the first line of defense against interception, duplication, and alteration of a confidential message, whether the message represents an electronic payment or a text.³⁰ Developments of systems requiring security on the Internet generally rely on “public key” encryption. In addition to keeping the contents of a message secret, these encryption procedures may also be used to create a “digital signature” which can enable the recipient of the message to independently verify the identity of the sender.

4.2. **Public key encryption.** Public key encryption, which is based on complex formulae involving certain mathematical properties of large prime numbers, is intended to allow someone to send a secure communication to a person with whom they have never met, or previously communicated.³¹ If they operate as intended, public key encryption techniques may play an important role in tax administration of electronic commerce transactions.

Public key cryptosystems, involve two related complementary strings of numbers called keys, a publicly revealed key and a secret key (also frequently called a private key). Each key unlocks the code that the other key makes. Knowing a person’s public key does not help you deduce the corresponding secret key. The public key can be published and widely disseminated across a communications network.

Anyone can use a recipient’s public key to encrypt a message to that person, and that recipient uses her own corresponding secret key to decrypt that message. No one but the recipient can decrypt it, because no one else has access to that secret key. Not even the person who encrypted the message can decrypt it.

29“By its very nature the Internet is an insecure channel. Packets of data consist of plain text with address information in the headers and are routed seemingly at random; even a modestly talented hacker can spoof an Internet address to intercept, read, and even alter those packets.” E. Bott, *Online Security*, PC/Computing, Sept. 1996, at 344. Private networks, such as inter-corporate networks, are considerably more secure since access to these networks is strictly controlled and the path that information can travel is circumscribed.

30This paper does not address, and is not intended to create any inferences regarding, any non-taxation issues relating to encryption.

31*The Road Ahead*, *supra* note 20, at 107; J. Prosis, *Digital Signatures: How They Work*, PC Magazine, Apr. 9, 1996, at 237.

Message authentication is also provided. The sender's own secret key can be used to encrypt a message, thereby creating a digital signature. Alternatively, the sender could use a separate key solely for the purpose of creating his digital signature. The recipient can check the validity of this digital signature by using the sender's public key to "decrypt" it. This proves that the sender was the true originator of the message, and that the message has not been subsequently altered by anyone else, because the sender alone possesses the secret key that made that signature. It is not practically possible to forge a digitally signed message and the sender cannot later disavow his signature.

These two processes can be combined to provide both privacy and authentication by first signing a message with the sender's secret key, then encrypting the signed message with the recipient's public key. The recipient reverses these steps by first decrypting the message with her own secret key, then checking the enclosed signature with the sender's public key. These steps are done automatically by the recipient's software.³²

³²Adapted from, Philip Zimmerman, *PGP™ Users Guide Volume I* (distributed with the computer program *PGP™*, available from <http://www.pgp.com> and many other Web sites).

5. PAYMENT MECHANISMS

5.1. **Introduction.** At present, a large portion of the money supply already exists in “digital” form, as bank account balances and other book entries with financial institutions, and is transferred in digital form through wire transfers. Physical tokens or paper instruments are no longer utilized for large-dollar payments in financial or foreign exchange transactions and roughly 90 percent of financial transactions, by value, are now conducted electronically. Conventional consumer transactions are also occurring electronically as the use of automatic teller machine cards in retail outlets continues to grow.

Electronic money, which is the focus of this chapter, involves consumer use of electronic payment systems that may partially displace cash, checks, and credit cards, which constitute about 90 percent, by volume, of financial transactions. These electronic payment systems have the potential to create new forms of money in which value is represented in digital form. “Electronic money” encompasses a wide range of products, which are all still under development. However, electronic money systems share certain similar features and an understanding of these general features is a necessary step in developing means to integrate these new payment systems into our system of tax administration and compliance.³³

5.2. **Electronic debit and electronic credit.** An electronic debit system is a payment system based on funds stored in a deposit account with a financial institution and subject to electronic payment orders to transfer funds from one account to another. An existing example of such a system is the use of automatic teller machine cards used at point of sale terminals. However, emerging electronic debit systems allow consumers to use an electronic checkbook, which can be either a hardware device or a software program, to generate unique check identifiers, maintain a check register, and create a digital signature. The electronic checks are sent via e-mail over the Internet from the payor to the payee, who uses a digital signature for endorsement and forwards it for deposit. Thus, consumers and retailers can gather, transmit, and deposit electronic checks into their accounts without physically going to a bank. If the electronic check is drawn on a bank account, it is cleared and settled through the banking system similar to a paper check.

Electronic credit systems use conventional credit card numbers to make payments over the Internet. Consumers transmit their credit card details to merchants, generally in encrypted form, who process transactions using the existing credit card payment infrastructure. In some cases third parties are used to approve and execute payments in order to eliminate the need to send a credit card number over the Internet.

33The Treasury Department is also considering the implications of electronic money systems in a number of other areas outside the scope of this paper, including bank regulation, consumer protection, and law enforcement. *See e.g.*, Department of the Treasury, *An Introduction to Electronic Money Issues*, Sept. 19, 1996 (available from Comptroller of the Currency, Communications Division, Washington, D.C. 20219).

Electronic debit and electronic credit systems should not raise any fundamental tax policy or administration issues because they essentially represent new ways of executing traditional bank or credit card transactions. Since an independent third party maintains records of the identity of the parties to a transaction and the amounts involved, these transactions are fully auditable. Moreover, unlike the electronic money systems described below, they do not involve new payment systems.

5.3. **Electronic money.** Electronic money involves tokens of value expressed in digital form, in the same sense that a casino chip is a token of value expressed in physical form. In contrast, the electric debit and credit card systems described above are the functional equivalent of conventional check and credit card transactions and do not involve the creation of new tokens of value. The digital form of electronic money allows it to be processed inexpensively and instantaneously transferred around the world. All electronic money systems function as payment systems or payment system components and all depend upon application of high-speed communication and information analysis.³⁴ Although no commonly accepted general definition of electronic money exists, some generalizations can be made.

! All purport to permit their users, in some environment, to move funds electronically.

! All rely upon advanced information technology to store, transmit, and receive representations of value.

! All depend upon modern developments in the science of encryption to provide security and upon public communications networks.

! All are possible only because of the reduced costs and economies of scale that technological advances create.

! All at some point, at least at present, require “loading” from funds held within the financial system.

The loading of funds involves the exchange of cash or deposits for digital value backed by an issuer. This could occur, for example, at an ATM, where a consumer loads a smart card with electronic cash and has a bank account debited for the same amount, or over the Internet by downloading electronic money onto a PC hard drive.

³⁴See generally, Department of the Treasury, Financial Crimes Enforcement Network, *Exploring the World of Cyberpayments: An Introductory Survey*, Sept. 27, 1995 (available from Financial Crimes Enforcement Network, Department of the Treasury, 2070 Chain Bridge Road, Vienna, VA 22182)[hereinafter *Cyberpayments*].

5.4. Distinctions between electronic money systems. Electronic money systems differ in a number of basic ways. The primary differences include:

- (i) the identity of the issuer;
- (ii) whether transactions are fully accounted for by the issuer;
- (iii) whether value resides in a ledger with a third party or on a storage device belonging to the consumer; and
- (iv) the means of accessing and transferring value.

These distinctions are discussed in more detail below. They are important because the way in which any particular electronic money system implements these distinctions will be the primary factors in determining how the system should fit into our system of tax administration and compliance and the concerns that the system poses for our system of tax administration and compliance.

5.5. Identity of the issuer. One distinction among electronic money systems is the identity of the issuer or sponsor. At present, electronic money can be issued by either a bank, a nonbank financial services company, or a non-financial company.

5.6. Whether transactions are fully accounted for by the issuer. The second distinction is whether electronic money transactions are fully accounted for by the issuer. There are both accounted and unaccounted systems. In an accounted system, the e-money issuer maintains a complete or partial audit trail of transactions, and can identify the person to whom the electronic money is issued as well as the people and businesses receiving the electronic money as it flows through the economy. In an unaccounted system, the e-money is issued and passes through the economy without a transaction trail. Unaccounted e-money may operate much like paper currency, moving through the economy anonymously.

There are advantages and disadvantages to both accounted and unaccounted electronic systems and they are likely to operate in tandem. Unaccounted systems may pose risks to the issuer because there are no records to rectify any problems that might arise. However, consumers may not feel comfortable using accounted electronic money for some transactions which they can currently conduct anonymously with cash. In addition an accounted system may impose costs on merchants and e-money issuers that would be passed on to consumers. These costs may be excessive relative to the benefits that consumers receive if electronic money is used for only small value transactions. In contrast, consumers may prefer accounted systems when they wish to have an independent record of the transaction.

5.7. Where the value resides. The third important distinction is whether the electronic money is stored on a ledger maintained by a third party (“notational electronic money”) or is

stored on a token which is maintained by the consumer (“token electronic money”). A notational electronic money system stores value as a notation in the ledger of a third party and is exchanged by subtracting amounts from one entry and adding it to another. The third party serves as an off-site control point which verifies and authorizes transactions. Token electronic money is represented by value stored on a “smart card,” computer disk drive, or other storage device and the value is directly exchanged between payor and payee like currency.

5.8. **Card vs. PC.** Finally, a distinction can be drawn between PC-based systems and card based systems.³⁵ In PC-based systems, value is transferred to and held in a personal computer and transferred electronically from one computer to another. The PC acts as both a storehouse of value and a device to access that value.

PC-based systems usually:

! enable payment to be made by either clicking on virtual notes and coins appearing on the screen or by typing in an amount;

! are fully integrated with Web browser software to facilitate impulse buying while browsing the Internet;

! show the user’s existing balance; and

! affirm transaction completion and maintain a running balance.

In contrast, card-based systems employ so-called “smart-cards” which are plastic cards containing microchips which can process and store any type of digital information, including electronic cash.³⁶ Customers load value onto their cards from their bank accounts by using automated teller machines or specially equipped telephones in their homes, and eventually, over the Internet.³⁷ In order to utilize the stored value a separate access device is needed which might be included in a vending machine or attached to a cash register. Similar to the farecards used on

³⁵See generally, *Cyberpayments*, *supra* note 34, at 8-9.

³⁶“The memory lets it store about 80 times as much information as the typical magnetic stripe on a credit card or fare card, and the processor makes possible the use of cryptographic methods to secure the data.” J. Gleick, *Dead as a Dollar*, N. Y. Times, June 16, 1996, Section 6 at 29. In the future, as the memory of these cards is expanded, they will be able to store more information, such as medical or other personal information. This raises certain privacy concerns that are outside the scope of this paper.

³⁷Sophisticated telephones with smart-card slots will soon be available. *Smart Phones: The Highest I.Q.’s Yet*, N. Y. Times, Sept. 5, 1996, at C2; See also, *Telephone Bill*, *The Economist*, Nov. 16, 1996, at 76.

many subway systems, the stored-value card is inserted into the access device which debits value from the card and transfers the value to the merchant's account. Card-based systems also differ from PC-based systems in that PC-based systems are designed to be used remotely, whereas card-based systems are designed for face-to-face commerce in retail transactions. This is not a rigid distinction because a PC or telephone could be used as an access device for a smart-card, which would enable the card to be used remotely.

Smart card systems can be further distinguished based by whether they are "open" or "closed" systems. In a "closed" system there is generally only one card issuer and one vendor that accepts the card for payments; usually the issuer and the accepting vendor are the same entity. Common examples of closed systems are public transportation farecards, prepaid telephone cards, and prepaid copier cards. In contrast, open systems involve single or multiple issuers which provide cards that can be used with multiple vendors. Card-based systems can also permit personal transfers of value between individuals, rather than just commercial transactions, provided that the individuals have the appropriate equipment.

5.9. Example of a PC-based system. One PC-based system, for example, permits customers to purchase electronic money from a bank, generally by debiting an existing bank account. As consumers browse various Web sites which sell goods and services, their electronic money software is active in the background. The program senses when payment is required and pops up a dialog box that prompts the buyer to approve the transaction. The software removes the digital "coins" from the buyer's hard disk and transfers the serial numbers representing the electronic money to the seller's computer. The seller's computer contacts the issuing bank, which verifies that the serial numbers representing the electronic money have not been used and notifies the seller that the electronic money is valid. At that point, the seller sends the electronic goods to buyer. The seller will eventually deposit the electronic money in a bank.

In the context of the analytical framework discussed above, such a system is a nonbank, token, unaccounted, pc-based system. Although the electronic money was issued by a bank, it is a nonbank system because a bank is not required. It is a token system because the strings of numbers representing "digital coins" are stored on the customer's computer, not a central ledger. Finally, it is an unaccounted system because the issuer does not maintain any records of how the electronic money is used until it is presented for conversion into conventional funds.

6. TAX POLICY AND ADMINISTRATION ISSUES: GENERAL CONSIDERATIONS

6.1. **General.** Any consideration of the substantive tax policy, and tax administration and compliance issues that arise in this area must be guided by basic tax policy principles and must also take into account the technical and scientific characteristics of the Global Information Infrastructure, including the Internet.

6.2. **Neutrality.** A fundamental guiding principle should be neutrality. Neutrality requires that the tax system treat economically similar income equally, regardless of whether earned through electronic means or through more conventional channels of commerce. Ideally, tax rules would not affect economic choices about the structure of markets and commercial activities. This will ensure that market forces alone determine the success or failure of new commercial methods. The best means by which neutrality can be achieved is through an approach which adopts and adapts existing principles — in lieu of imposing new or additional taxes.

Recent technological developments may appear to be radical innovations primarily because they have evolved within a relatively short period of time. However, careful examination may very well reveal that few, if any, of these emerging issues will be so intractable that their resolution will not be found using existing principles, appropriately adjusted.

6.3. **Impact of technical features of the Internet.** The policies and rules governing the taxation of electronic commerce cannot be developed without an understanding of the underlying technical features. Although chapter three presented a sampling of current means of electronic commerce, the basic technical structure of the Internet has some important implications for tax policy and administration. These aspects are restated here.

6.3.1. **Radically decentralized; no central control.** The Internet has no physical location. Users of the Internet have no control and in general no knowledge of the path traveled by the information they seek or publish. Many participants in the system are administrators or intermediaries who have no control over what type of information travels over their computers; rather they offer interconnectivity which enables the system to operate. In practical terms, it would therefore be difficult to monitor or prevent transmissions of information or electronic cash across the Internet. From a technical perspective, in principle and generally in practice, it makes no difference whether the information or electronic money sought to be transmitted are within one jurisdiction or between several, as the Internet pays little or no regard to national boundaries.

6.3.2. **Disintermediation.** In general, tax compliance is facilitated by identifying key “taxing points:” for example, reporting requirements can be imposed on financial institutions which are easy to identify. In contrast, one of the great commercial advantages of electronic commerce is that it often eliminates the need for intermediating institutions.

6.3.3. Weak correspondence between computer domain name and reality.

The pieces of an Internet address (or “domain-style name”) tell you who is responsible for maintaining that name. It may not tell you anything about the computer corresponding to the actual Internet address, or even where that machine is located. Even if an e-mail address is clearly associated with a certain person and computer, that person and her computer could be located anywhere in the world. This makes it difficult to determine a person’s location and identity, which is often important for tax purposes.

6.3.4. Lack of central control / Registration. It is not difficult to introduce a new computer to the Internet. Registration requirements are not difficult to satisfy, and there is little to prevent transfer of the site to new controllers. In general, proof of identity requirements for Internet use are very weak.

6.3.5. Auditability / Remote control. Untraceable use of an Internet site, with the permission of the site’s controllers, is quite easy to arrange. For example, if Anne, who lives in Australia, is running a commercial site on the Internet for U.S. customers, using a computer located in Canada, Anne can control the Canadian computer from Australia through a series of computer programs which can be configured to leave no audit trail. Moreover, if the need arises, operations can be shifted to somewhere else on the Internet.

6.3.6. Detection of contents. Since all electronic communication consists of streams of binary digits, it is difficult, if not impossible, to determine the contents until converted. At present, a personal letter appears indistinguishable from a message transmitting electronic money. Even if the nature of the contents is determined, the use of encryption could preclude comprehension.

7. SUBSTANTIVE TAX LAW ISSUES

7.1. Introduction

7.1.1. **General.** This section discusses the impact of electronic commerce on substantive principles of taxation.³⁸ Current tax concepts, such as the U.S. trade or business, permanent establishment, and source of income concepts, were developed in a different technological era. However, the principle of neutrality between physical and electronic commerce requires that existing principles of taxation be adapted to electronic commerce, taking into account the borderless world of cyberspace. An advantage of an approach based on existing principles, in addition to neutrality, is that such an approach is suitable for adaptation as an international standard. Existing principles are, in broad outline, common to most countries' tax laws.

7.1.2. **Bases for taxation.** The United States taxes income on the basis of both the source of the income and the residence of the person earning that income. U.S. source income is subject to tax³⁹ when earned by foreign persons as is the worldwide income of U.S. citizens, residents, and corporations.⁴⁰ Although U.S. persons are subject to net basis taxation on their worldwide income, the foreign tax credit provisions avoid double taxation of foreign source income.⁴¹ Our international tax treaty network, while attempting to minimize taxation at source, also protects against double taxation.

7.1.3. **Source of income.** Source of income concepts play a central role in international taxation since the country of source generally has a right to tax income and

38This chapter is focused on certain broad themes arising under United States international tax rules. However, certain specific provisions of the Code and Regulations may relate quite directly to technological developments and the growing role of intangibles in the modern economy. For example, U.S. persons are increasingly engaging in joint ventures in which intangibles play a major role and U.S. companies frequently provide intangibles to international joint ventures. If the transferred property is an intangible, section 367(d) may apply to treat the U.S. transferor as having licensed the intangible property to a related foreign corporation in exchange for an arm's length royalty. In addition, sections 863(d) and (e) provide source rules for income arising from space and certain ocean activities and international telecommunications. Regulations have not been issued under either subsection. Treasury invites comments with respect to the relationship between the evolving issues described in this paper and these Code provisions and related interpretative guidance.

39Sections 871, 881 and 882.

40Sections 1 and 11.

41Section 901 *et seq.*

residence countries generally avoid double taxation through either a credit system or an exemption system. Source of income principles are generally similar worldwide. In general, the source of income is located where the economic activities creating the income occur. For example, income derived from the use of intellectual property has its source in the location where the intellectual property is utilized.⁴² Compensation for labor or personal services has its source in the location where the labor or personal services are performed.⁴³ Furthermore, residence-based source rules have been adopted for certain types of income such as capital gains and swap income because the country of residence represents the location where the economic activity that produces the income occurs.⁴⁴ Generally, the nature of an item of income is important for determining source because the source of income flows from its nature.⁴⁵

7.1.4. **Role of tax treaties.** The United States currently has comprehensive income tax treaties with 48 countries. The rules embodied in these tax treaties generally give the residence country an unlimited right to tax income while limiting or eliminating the source country's right to tax. One of the most important concepts in tax treaties is that of a "permanent establishment." Source countries tend to give up their source-based taxing rights over business profits if they are not attributable to a "permanent establishment" or "fixed base" in their jurisdiction. Treaties generally limit the rate of taxation at source that can be applied to interest, dividends, and royalties paid to a resident of a treaty partner.

7.1.5. **The ascendancy of residence-based taxation.** The United States, as do most countries, asserts jurisdiction to tax based on principles of both source and residence. If double taxation is to be avoided, however, one principle must yield to the other. Therefore, through tax treaties, countries tend to restrict their source-based taxing rights with respect to foreign taxpayers in order to exercise more fully their residence-based taxing rights. This occurs in a number of ways. The permanent establishment concept represents a preference for residence-based taxation by setting an appropriate threshold for source-based taxation of active business income. By setting a threshold, in most cases it is not necessary to identify the source of active business income and the income is only subject to tax in the country of residence. In the case of interest, dividends, and royalties, the income is still potentially subject to source-based taxation but in many cases is effectively subject to only residence-based taxation because of a nil rate of withholding. The country of residence also agrees to take appropriate steps to ameliorate any possible double taxation resulting from the limited source-based taxation.

42Section 861(a)(4).

43See section 861(a)(3).

44See section 865, and Rev. Rul. 87-5, 1987-1 C.B. 180.

45Sections 861 through 865.

The growth of new communications technologies and electronic commerce will likely require that principles of residence-based taxation assume even greater importance. In the world of cyberspace, it is often difficult, if not impossible, to apply traditional source concepts to link an item of income with a specific geographical location. Therefore, source based taxation could lose its rationale and be rendered obsolete by electronic commerce. By contrast, almost all taxpayers are resident somewhere. An individual is almost always a citizen or resident of a given country and, at least under U.S. law, all corporations must be established under the laws of a given jurisdiction. However, a review of current residency definitions and taxation rules may be appropriate.

In situations where traditional source concepts have already been rendered too difficult to apply effectively, the residence of the taxpayer has been the most likely means to identify the jurisdiction where the economic activities that created the income took place, and thus the jurisdiction that should have the primary right to tax such income. For example, in the Tax Reform Act of 1986, Congress adopted residence-based sourcing rules for sales of noninventory property. This reflected Congress' belief "that source rules for sales of personal property should generally reflect the location of the economic activity generating the income, taking into account the jurisdiction in which those activities are performed."⁴⁶ In the case of certain sales of personal property, the residence of the seller was thought to best represent the location where the underlying economic activity occurred.⁴⁷ Similar rules were adopted for certain space and ocean activities.⁴⁸ Therefore, United States tax policy has already recognized that as traditional source principles lose their significance, residence-based taxation can step in and take their place. This trend will be accelerated by developments in electronic commerce where principles of residence-based taxation will also play a major role.

7.2. U.S. Trade or Business and Permanent Establishment

7.2.1. Taxation of non-resident aliens and foreign corporations. Non-resident aliens and foreign corporations are generally only subject to tax on their U.S. source income, including income derived from the performance of personal services in the United States, and certain foreign source income that is attributable to a U.S. trade or business. Unless a treaty applies, non-resident aliens and foreign corporations are taxed at ordinary graduated rates on their net income effectively connected with a trade or business in the United States,⁴⁹ and are taxed at a flat rate on the gross amount of their U.S. source "fixed or determinable annual or

⁴⁶Staff of the Joint Committee on Taxation, *General Explanation of the Tax Reform Act of 1986*, 100th Cong. 1st Sess, (May 7, 1987) at 917. [hereinafter *1986 Bluebook*.]

⁴⁷*Id.*

⁴⁸Code section 863(e); *See also*, *1986 Bluebook*, *supra* note 46, at 932.

⁴⁹Section 871(b) and 882(a); *See also*, section 864(c).

periodical gains, profits and income.”⁵⁰ A U.S. trade or business includes the performance of personal services within the United States.⁵¹ Therefore being engaged in a trade or business *in the United States* is a threshold requirement for the taxation of active business income earned by foreign persons.

7.2.1.1. **“In the United States.”** In many cases, it is clear that a foreign person is engaged in a trade or business but it is not clear whether they are so engaged “in the United States.”⁵² However, a foreign person not physically present in the United States who merely solicits orders from within the United States only through advertising and then sends tangible goods to the United States in satisfaction of the orders is unlikely to be engaged in a trade or business in the United States even though such a person is clearly engaged in a trade or business.⁵³ A person who is not directly engaged in a U.S. trade or business may nevertheless be deemed to be engaged in a U.S. trade or business as the result of the activities of an agent.

7.2.2. **Impact of tax treaties: Permanent establishment concept.** Tax treaties adopt a different and generally higher threshold for source basis taxation of active income. U.S. source active income (“business profits”) of non-resident aliens and foreign corporations who are entitled to benefits under a U.S. income tax treaty is only subject to U.S. tax if the income is attributable to a permanent establishment located in the United States. A permanent establishment is a fixed place of business through which the business of an enterprise is wholly or partly carried on.⁵⁴ “[I]t has come to be accepted in international fiscal matters that until an enterprise of one State sets up a permanent establishment in another State it should not properly be regarded as participating in the economic life of that other State to such an extent that it comes within the jurisdiction of that other State’s taxing rights.”⁵⁵ Therefore, a foreign person who is entitled to benefits under a tax treaty with the United States will not be subject to U.S. tax on the

⁵⁰Section 871(a) and 881(a); *See also*, section 894.

⁵¹Section 864(b).

⁵²The difficulties in determining whether a foreign person is engaged in a trade or business in the United States may be a reason to consider replacing the Code’s U.S. trade or business concept with the permanent establishment concept found in both U.S. tax treaties and the domestic laws of many of our trading partners. Treasury invites comments on this issue.

⁵³*See*, *Piedras Negras Broadcasting Co. v. United States*, 43 B.T.A. 297 (1941) *aff’d*, 127 F.2d 260 (5th Cir. 1942).

⁵⁴United States Model Income Tax Convention of September 20, 1996, Article 5, paragraph 1 [hereinafter *U.S. Model Tax Convention*].

⁵⁵Model Tax Convention on Income and Capital, OECD Committee on Fiscal Affairs (1995), Commentary to Article 7, at paragraph 3 [hereinafter *OECD Model Tax Convention*].

income arising from a trade or business in the United States if the income is not attributable to a permanent establishment in the United States.

7.2.3. U.S. tax jurisdiction in the context of electronic commerce.

7.2.3.1. U.S. trade or business. The concept of a U.S. trade or business was developed in the context of conventional types of commerce, which generally are conducted through identifiable physical locations. Electronic commerce, on the other hand, may be conducted without regard to national boundaries and may dissolve the link between an income-producing activity and a specific location. From a certain perspective, electronic commerce doesn't seem to occur in any physical location but instead takes place in the nebulous world of "cyberspace." Persons engaged in electronic commerce could be located anywhere in the world and their customers will be ignorant of, or indifferent to, their location. Indeed, this is an important advantage of electronic commerce in that it gives small businesses the potential to reach customers all over the world.

Electronic commerce permits a foreign person to engage in extensive transactions with U.S. customers without entering the United States. Although such a person is clearly engaged in a trade or business, questions will arise as to whether he is engaged in a trade or business in the United States or has a permanent establishment in the United States. Therefore, it is necessary to clarify the application of the U.S. trade or business and permanent establishment concepts to persons engaged in electronic commerce. In developing principles to classify these activities, it will be important to consider the extent to which electronic commerce simply represents an extension of current means of doing business, the tax consequences of which are understood. For example, to the extent that the activities of a person engaged in electronic commerce are equivalent to the mere solicitation of orders from U.S. customers, without any other U.S. activity, it may not be appropriate to treat such activities as a U.S. trade or business. It will also be necessary to consider whether it is appropriate or practical to treat foreign persons engaged in electronic commerce with U.S. customers as being engaged in a U.S. trade or business if they are physically located outside the United States.

Another example is the treatment of foreign persons who maintain or utilize a computer server in the United States. Computer servers can be located anywhere in the world and their users are indifferent to their location. It is possible that such a server, or similar equipment, is not a sufficiently significant element in the creation of certain types of income to be taken into account for purposes of determining whether a U.S. trade or business exists. It is also possible that if the existence of a U.S.-based server is taken into account for this purpose, foreign persons will simply utilize servers located outside the United States since the server's location is irrelevant.

Finally, consideration may also be given to the role other activities should play in determining whether a U.S. trade or business exists. For example, it may ultimately be decided that a foreign person who operates a computerized research service through computers located

outside of the United States might not be engaged in a U.S. trade or business unless other U.S. situs activities exist. However, U.S.-based individuals engaged in providing marketing and support services for a foreign-based provider of computerized research may create a U.S. trade or business for the foreign person even if the computer servers and other activities are located outside the United States.

7.2.4. Permanent Establishment. To the extent that a foreign person is not engaged in a U.S. trade or business, then the absence of a permanent establishment is irrelevant since the United States will not tax that person's active business income. However, some persons entitled to benefits under a U.S. income tax treaty will not be subject to U.S. tax due to the lack of a permanent establishment, notwithstanding the fact that they may be engaged in a U.S. trade or business. A U.S. permanent establishment generally requires a fixed place of business in the United States although a permanent establishment can also arise by imputation from the activities of an agent.⁵⁶ Therefore, persons engaged in electronic commerce may not have a U.S. permanent establishment because they do not have a fixed place of business in the United States, unless a permanent establishment is created by imputation, as discussed in section 7.2.5 below.

Telecommunications or computer equipment owned or used by a foreign person engaged in electronic commerce raises a question as to whether this equipment could constitute a fixed place of business of the foreign person in the United States, taking into account that there would not necessarily be any employees present.⁵⁷ It will be necessary to consider whether a foreign person who owns or utilizes a computer server located in the United States should be deemed to have a U.S. permanent establishment. Again, it is useful to review the treatment of existing, traditional commercial activities and consider whether any existing exclusions from permanent establishment treatment should apply in this situation. For example, a permanent establishment generally does not include the use of facilities solely for the purpose of storage, display, or delivery of goods or merchandise. . . ."⁵⁸ For a business which sells information instead of goods, a computer server might be considered the equivalent of a warehouse.⁵⁹ Examination and interpretation of the permanent establishment concept in the context of electronic commerce may well result in an extension of the policies and the resulting exceptions to electronic commerce.

⁵⁶U.S. Model Tax Convention, *supra* note 54, Article 5, paragraph 5.

⁵⁷See *e.g.* OECD Model Tax Convention, *supra* note 55, Commentary to Article 5, at paragraph 10 (circumstances under which a vending machine could constitute a permanent establishment).

⁵⁸See U.S. Model Tax Convention, *supra* note 54, Article 5, paragraph 4(a); OECD Model Convention, *supra* note 55, Article 5, paragraph 4(a).

⁵⁹Some very large-scale servers are colloquially referred to as "data warehouses." See *e.g.*, L. Gomes, *Let's Share*, Wall Street Journal, Nov. 18, 1996, at R23.

7.2.5. U.S. trade or business or permanent establishment by imputation: telecommunications and Internet service providers. A U.S. trade or business or permanent establishment can also arise by imputation from an agent's activities.⁶⁰ Agency issues arise from the relationship between a foreign person and a computer online service or telecommunications service provider. Even if a person engaged in electronic commerce does not maintain a computer server or similar equipment in the United States, issues of U.S. trade or business or permanent establishment would also arise. In most cases, information will be transmitted to the customer's computer through telephone lines. For example, a foreign person who operated a computerized research service might contract with a U.S. telecommunications company to provide local dial access service so that the foreign person's U.S. customers can access its computerized databases. Alternatively, the U.S. customers might access the foreign information seller's Web site using a U.S.-based Internet service provider. Presumably, the foreign person's relationship with a local telecommunications service provider is such that the telecommunications service provider would not even be considered an agent of the foreign person. Even if an agency relationship were deemed to exist, the service provider would likely be considered an independent agent, with the result that a U.S. trade or business or permanent establishment would not arise.⁶¹ Nevertheless, it may be necessary to further clarify the applicable principles in this area and seek to create an international consensus on this issue.

7.2.6. Taxation of telecommunications service providers. The principles used to determine whether a person is engaged in a U.S. trade or business or maintains a U.S. permanent establishment might differ if the person is primarily engaged in providing telecommunications services, in contrast to a business which is primarily engaged in selling goods or services for whom the telecommunications services are merely incidental.⁶² A distinction is generally recognized between activities that "contribute to the productivity of the enterprise" and activities that involve the "actual realization of profits."⁶³ In the case of a foreign telecommunications service provider, the operation of a computer server in the United States or the sale of computing services and Internet access to U.S. and foreign customers is clearly integral to the realization of its profits, in contrast to the case of a foreign person who is primarily engaged in selling data which is stored on a U.S.-based server.

⁶⁰U.S. Model Tax Convention, *supra* note 54, Article 5, paragraph 5.

⁶¹*Id.* at Article 5, paragraph 6; *See also*, OECD Model Tax Convention, *supra* note 55, Article 5, paragraph 5.

⁶²OECD Model Tax Convention, *supra* note 55, Commentary to Article 5, at paragraph 23.

⁶³*Id.*

7.3. Digitized Information: Classification of Income

7.3.1. **Transactions in digitized information.** Any type of information that can be digitized, such as computer programs, books, music, or images, can be transferred electronically. For example, a U.S. person could, via the Internet, communicate with a computer located in a foreign country and download a computer program or digitized image or video in exchange for a fee. The purchaser's rights in the information transferred could vary depending on the contract between the parties.

The purchaser of a digitized image could obtain the right to use a single copy of the image, the right to reproduce ten copies of the image for use in a corporate report, the right to reproduce the image for use in an academic work that is expected to have a limited press run, or the right to reproduce the image in a mass-circulation magazine.⁶⁴ Depending on the facts and circumstances, some of these transactions may be viewed as the equivalent of the purchase of a physical copy or copies of the photograph, which would probably not subject the seller to U.S. taxation, while other of these transactions would result in royalty income because they involve payments for the use of or the privilege of using copyrights or similar property in the United States, which could be taxable in the United States.⁶⁵

Technological developments have necessitated a reexamination of existing income classification principles in light of the ease of perfectly reproducing and disseminating digitized information. Classifying transactions involving digitized information may require a more complex analysis that disregards the form of the transaction — without regard to whether tangible property is involved — in favor an analysis of the rights transferred. This is necessary to ensure neutrality between the taxation of transactions in digitized information and transactions in traditional forms of information, such as hard copy books and movies, so that decisions regarding the form in which information is distributed are not affected by tax considerations.

7.3.2. **Classification of income issues.** Information that can be digitized is generally protected by copyright law. Payments made for the use of or for the privilege of using copyrights are considered royalties.⁶⁶ Similarly the U.S. Model Tax Convention defines “royalties” as “payments of any kind received as consideration for the use of, or the right to use, any copyright of literary, artistic or scientific work including cinematograph films”⁶⁷ It is not always clear how this definition applies to the sale of digitized information. Yet, it is clear that

⁶⁴See section 3.2.5.*supra*.

⁶⁵See, section 861(a)(4) and sections 871(a)(1) and 881(a)(1); *Compare*, U.S. Model Tax Convention, *supra* note 54, Article 12.

⁶⁶Section 861(a)(4); Treas. Reg. §1.861-5.

⁶⁷U.S. Model Tax Convention, *supra* note 54, Article 12, paragraph 2.

some of these transactions, such as the electronic purchase of computer programs, are merely substitutes for conventional transactions involving physical objects.

Digitized information also presents unique issues because it can be perfectly reproduced, often by the purchaser. Although someone desiring to purchase ten copies of a bound book will generally purchase ten copies from a publisher, someone wishing to purchase ten copies of an electronic book may simply purchase one copy and acquire the right to make nine additional copies. This transaction might literally be considered to create royalty income, at least in part, since the right to make reproductions is a right reserved to the copyright holder and by allowing a third party to make reproductions, the payment is, at least in part, in consideration for the use of the copyright. However, this transaction may also be viewed as merely a substitute for the purchase of ten copies from the publisher in which the purchaser has undertaken to make the copies, a process which would not be feasible were the information not digitized. Therefore, it is necessary to apply the definition of “royalties” in a manner that takes into account the unique characteristics of digitized information.

7.3.3. Proposed regulations on computer program transactions. The proposed regulations on the classification of income from transactions involving computer programs represent an initial attempt to resolve this issue.⁶⁸ The regulations invite comments prior to finalization. Although these regulations are proposed to be limited to transactions involving computer programs they may establish a framework applicable to any type of digitized information, at least to the extent it is protectable by copyright. Treasury requests comments on this issue.

These proposed regulations do not seek to make determinations based on whether property is “tangible” or “intangible” because those concepts do not properly capture the unique features of digitized information. For example, when a computer disk containing a program is transferred, that would appear, on its face, to be a transaction in a tangible object. When the same program is transferred by means of electronic impulses transmitted over a telephone line, it would seem to be an intangible. Both of these classifications, however, ignore the substance of the transactions and the analysis of the proposed regulations avoids this confusion, in part by treating the means of transfer as irrelevant.

The proposed regulations treat transactions involving computer programs as being either: (1) transfers of copyright rights, (2) transfers of copies of the copyrighted program, (3) the provision of services for the development or modification of a computer program; or (4) the provision of know-how regarding computer programming techniques.⁶⁹ Because computer programs are protected under copyright law and the rights that transferees of computer programs obtain are primarily rights created by copyright law, the proposed regulations take copyright law

68Prop. Treas. Reg. §1.861-18, 61 Fed. Reg. 58, 152 (Nov. 13, 1996).

69Prop. Treas. Reg. §1.861-18(b)(1).

rights as the starting point for the analysis. They demonstrate that an understanding of these rights makes it possible to analyze computer program transactions in the framework of existing principles of tax analysis.

The primary distinction established by the proposed regulations is between transfers of copyright rights and transfers of copyrighted articles. The proposed regulations use copyright law principles to determine whether the rights transferred are rights in the underlying copyright or are rights in a copyrighted work. However, the proposed regulations depart from copyright law when appropriate to take into account the special characteristics of computer programs. Tax law principles are then applied to determine whether or not there has been a partial or complete transfer of these rights, which will determine the tax classification of the resulting income. If a transaction is considered to involve copyright rights, it is either a sale or exchange of the copyright, or a license, depending on whether “all substantial rights” in the copyright have been transferred. If the transaction is a transfer of a copyrighted article, then it is either a sale or exchange, or a lease of the copyrighted article, based on an application of the “benefits and burdens” test. Because this comprehensive framework is based on an analysis of the underlying rights, it may be flexible enough to handle transactions in computer programs and other types of digitized information that are yet to be invented.

These concepts and distinctions can, of course, be found in existing law. The novel aspect of the proposed regulations is that they take into account the unique characteristics of digitized information. For example, for copyright law reasons, computer programs are generally sold pursuant to “license” agreements. Software developers transfer rights in computer programs to individual users through licenses, rather than sales, to prevent transferees from claiming the rights that would be provided under copyright law to purchasers of copies of the program. Therefore, the proposed regulations seek 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 program copy.⁷⁰

As indicated above, the proposed regulations take the unique characteristics of digitized information into account in departing from a strict copyright law analysis. For example, computer programs are frequently distributed through site licenses. Under a site license, a “licensee” might obtain only one disk containing the program but also obtains the right to make a certain number of copies for internal use. Notwithstanding the term applied to the transaction or the grant of a copyright right under U.S. copyright law, the regulations propose to treat this

⁷⁰“In the field of taxation, administrators of the laws, and the courts, are concerned with substance and realities and formal written documents are not rigidly binding.” *Helvering v. Lazarus & Co.*, 308 U.S. 252, 255 (1939). On the subject of computer program licenses, *see generally*, Rice, *Licensing the Use of Computer Program Copies and the Copyright Act First Sale Doctrine*, 30 *Jurimetrics* 157 (1990)

transaction as a sale of goods for tax purposes.⁷¹ Although the right to reproduce a computer program is a right granted to the owner of the copyright, which would make the transaction a license (resulting in royalties) under a pure copyright law analysis, the proposed regulations recognize that the bare right to copy a program is not relevant for purposes of this analysis. Since digitized information can be perfectly copied at little cost, the bare right to reproduce is disregarded for tax purposes. The proposed regulations provide that the right to reproduce is only relevant when it is coupled with the right to sell the copies so made to the public. This is a case where existing tax principles have been adapted to take into account the unique features of electronic commerce.

7.3.4. Definition of services income. Digitized information may also further complicate existing difficulties in defining services income, as distinguished from sales of goods income or royalties.⁷² This distinction is important for purposes of determining the source of income, and for the application of various Code provisions including the Subpart F rules. Under subpart F, the definition of foreign base company sales income differs from the definition of foreign base company services income.⁷³ Therefore, whether a transaction is deemed to result in sale of goods income, as distinguished from services income, may affect whether such income will be Subpart F income that will be subject to current tax.

The distinction between services income and other types of income is a pervasive issue throughout the Code. For example, in many cases, the distinction between service contracts and other arrangements is unclear.⁷⁴ Although many commercial transactions involve elements of both the provision of tangible property and the performance of services, these transactions are generally classified in accordance with their predominant characteristic. For example, a transaction involving the performance of professional services may result in the provision of a letter or other document. The aspect of the transaction consisting of the provision of the tangible property is treated as incidental to the performance of the services.⁷⁵ encyclopedia's content can be accessed. If the customer has a sufficiently fast modem connection, there may be little practical difference between accessing the on-line service and the CD-ROMs on the customer's

⁷¹Prop. Treas. Reg. §1.861-18(h), *Example 10*.

⁷²See e.g., *Karrer v. U.S.*, 152 F.Supp. 66 (Ct. Cl. 1957).

⁷³Compare sections 954(d) and 954(e).

⁷⁴See e.g. section 7701(e). (Factors for use in determining whether a transaction should properly be treated as a lease of property or the performance of services.)

⁷⁵See e.g. Rev. Proc. 71-21, 1971-2 C.B. 549. (Circumstances under which an accrual method taxpayer may defer the recognition of advance payments for the performance of services.)

personal computer. The sale of the CD-ROMs may result in sale of goods income⁷⁶ while the classification of the income arising from the on-line service is not clear. The on-line service may result in services income although in some circumstances it could be characterized as a means of distributing copies of copyrighted works. However, a distinction between sales of goods and services income may still be appropriate in this area taking into account the frequency at which the on-line service will be updated and the fact that the user of the online service must continue to make periodic payments, as contrasted with the fact that the purchaser of the CD-ROM may acquire the right to use the disk in perpetuity for a single payment.⁷⁷ It will be necessary to consider the principles to be applied in these situations that will best implement the policy behind the underlying Code provisions.

7.3.5. Effect on controlled foreign corporation rules. The ability of taxpayers to electronically sell digitized information and services may have an effect on existing rules regarding the controlled foreign corporation provisions of Subpart F.⁷⁸ Subpart F limits the use of tax deferral through controlled foreign corporations (CFCs) by currently taxing certain types of highly mobile income to the CFC's "United States shareholders." If CFCs can engage in extensive commerce in information and services through Web sites or computer networks located in a tax haven, it may become increasingly difficult to enforce Subpart F. Some persons engaged in electronic commerce may already be locating their businesses offshore.⁷⁹ As discussed in Chapter 8 below, this presents enforcement problems because it may be difficult to verify the identity of the taxpayer to whom foreign base company sales income accrues and the amount of such income. It may be necessary to revise Subpart F or the regulations thereunder to take these new types of transactions into account.

7.4. Source of Services Income

7.4.1. Geographic basis. Income derived from the performance of labor or personal services only constitutes U.S. source income if the person performing the services is

⁷⁶See PLR 9633005 (Aug. 19, 1996).

⁷⁷The fact patterns could be reversed with possibly different results. While the CD-ROM purchaser may make periodic payments and receive regular updates, the online service might charge an initial lump sum fee which includes updates. It may be necessary to consider whether this difference in payment mechanisms is relevant.

⁷⁸Sections 951-964.

⁷⁹M. Murphy, *Cooling the Net Hype*, *Wired*, Sept. 1996, at 86. ("Companies selling information over the Internet can call any place home, and the savvy ones are choosing jurisdictions with low or no taxes, financial privacy, governmental stability, and decent communications systems. (Warm water and sandy beaches are also a plus.)")

physically present in the United States.⁸⁰ This is also a generally accepted international principle.⁸¹ This requirement is based on the view that there is generally an independent, substantial significance to the location where the person rendering the services is located with the result that it is reasonable for that country to tax such services. This concept is also relevant for purposes of Subpart F since foreign base company services income only includes services which “are performed outside the country under the laws of which the controlled foreign corporation is organized.”⁸² As travel and communications have become more efficient and less expensive, the relationship between the service provider’s location and the service consumer’s location has weakened. For example, it is now possible for physicians to remotely diagnose certain diseases through telecommunications links and videoconferencing has eliminated the need for many face-to-face meetings.

7.4.2. Role of existing concepts. These technological developments are generally extensions of existing communications devices. For example, a video conference is likely to be a substitute for a conference telephone call. Although these communications developments may pose some base erosion potential since service providers will find it easier to relocate to low-tax jurisdictions, it may be the case that the base erosion potential is not so significant as to require review of the current general principles of residence-based taxation applicable to services. In devising rules to source this type of income, it may also be necessary to consider the relationship between the service-provider’s physical location and other potential indicia of source, such as the location of a computer server or communications link. Furthermore, to the extent the source of this income is becoming both less meaningful and increasingly difficult to determine, residence-based taxation should necessarily play a larger role.

80Section 861(a)(3); Section 862(a)(3).

81OECD Model Tax Convention, *supra* note 55, Commentary to Article 15, at paragraph 1.

82Section 954(e).

7.5. Global Services: Allocation Of Income And Expenses

7.5.1. **Global collaboration.** The foregoing section discussed the problem of determining the source of income derived from the performance of services. A related issue arises from increases in global collaboration arising from modern telecommunications. One example is global dealing. As discussed above, global dealing refers to the capacity of financial intermediaries, mainly banks and securities firms, to execute customers' orders and to take proprietary positions in financial products in markets around the world and around the clock. Global dealing could not take place without modern computers and communications, which permit a firm's trading position to be transferred around the world as markets open and close. Similarly, certain scientific and engineering projects are now being worked on twenty-four hours a day as laboratories in one region electronically hand-off the project at the end of the day to a laboratory where the day is beginning.⁸³ This type of global collaboration is expected to increase.⁸⁴

7.5.2. **General principles of allocation.** Global collaboration is not a new concept. When goods are manufactured in one country and marketed and distributed in another, the overall transaction could be characterized as global collaboration in the sale of goods. Global collaboration requires transfer pricing and source of income principles, to correctly allocate the resulting income between the countries involved. Current transfer pricing principles are focused on global collaboration in the manufacture and sale of goods and the creation and transfer of intangibles.⁸⁵ The cost sharing regulations under section 482 apply to allocate the results of certain global research and development efforts, but only when intangibles are created.⁸⁶

By contrast, global dealing income has been allocated through case-by-case negotiations between the competent authorities involved, although a guidance project on global dealing is currently developing rules of general application.⁸⁷ As the ways in which companies collaborate globally to provide services continue to grow, it may be appropriate to consider the creation of general principles for the arm's length allocation of broader categories of services income based

83See, O. Suris, *Behind the Wheel*, Wall Street Journal, Nov. 18, 1996, at R14.

84See, C. Levin and S. Rupley, *Collaboration on Call*, PC Magazine, Sept. 10, 1996, at 31; *Will Habanero be the Next Big Thing?*, Wall Street Journal, May 30, 1996, at B6.

85Treas. Reg. §1.482-1 through -8.

86Treas. Reg. §1.482-7. ("A cost sharing arrangement is an agreement under which the parties agree to share the costs of development of one or more intangibles in proportion to their shares of reasonably anticipated benefits from their individual exploitation of the interests in the intangibles assigned to them under the arrangement." Treas. Reg. §1.482-7(a)(1).)

87Intl 070-90; *See also*, Notice 94-40; 1994-1 C.B. 351.

on each situation's particular facts. These rules could be implemented through Treasury Regulations and international consensus. To the extent that capital is not a material income-producing factor in this situation, it would be expected that the place where the component services were performed would be of primary importance in allocating such income.

8. TAX ADMINISTRATION AND COMPLIANCE ISSUES

8.1. **General.** In the area of tax administration and compliance, electronic commerce may create new variations on old issues as well as new categories of issues. These developments require that practical techniques be developed to deal with these technological innovations. As discussed in this chapter, these technological developments touch on a wide range of issues affecting the administration of our tax laws.⁸⁸ In many cases, the products and techniques that will be required cannot be developed or implemented by Treasury or the IRS on a unilateral basis. Private sector and international cooperation is likely to be necessary to develop and implement appropriate software and hardware technologies.

Electronic commerce is still developing and no electronic money system has yet achieved widespread usage. Nevertheless, it is important to consider these issues now since some issues may require that the needs of tax administration be addressed while electronic commerce systems are still under development. Others issues may not require immediate action and decisions can be delayed while Treasury and the IRS obtain more experience with these systems.

8.2. **Categories of issues.** These technological developments create issues under many different sections of the Code. Instead of dealing with these issues with respect to particular Code sections, they will instead be approached on the basis of their technological features. This is both a more useful means of categorizing these issues and is also more likely to identify potential solutions since solutions must be tailored to the technology. These broad categories of issues, which are discussed in detail below, are:

- (i) electronic money;
- (ii) identity verification;
- (iii) record keeping and transaction verification for electronic transactions; and
- (iv) disintermediation and information reporting.

8.3. **Electronic money.** As discussed in chapter 5, developments in electronic payment systems have the potential to create “electronic money.” Electronic money is a broad term, and just as electronic money systems differ in their technical features, they also differ in the extent to which they create issues for tax administrators. Depending on the type of system used, electronic money can be either an advantage or a disadvantage for tax administrators.

⁸⁸These developments also raise issues under the criminal provisions of the Internal Revenue Code, sections 7201-7344, and under the Bank Secrecy Act, 12 U.S.C. §§1829b, 1951-1959, and 31 U.S.C. §§ 5311-5330. However, these issues are outside the scope of this study.

As discussed below, electronic money poses a tax evasion potential similar to that created by paper money. This raises the issue of whether the evasion potential is manageable and what must be done to manage it. As discussed below, it is possible that the techniques that have been developed over time to combat evasion using paper money can be adapted and expanded to combat evasion through electronic money. In particular, it may be necessary to consider the role that issuers of electronic money can play in this effort, since they represent the interface between the physical economy and the electronic economy. In general, however, the extent to which electronic cash will be a problem will likely depend on the extent to which it results in an extensive payment system outside of normal banking channels. Treasury intends to study, and requests comments on these issues, including the extent to which (i) current techniques can be adapted to combat tax evasion using electronic cash, (ii) new audit techniques will be necessary, and (iii) information reporting and similar requirements can and should be imposed on issuers of electronic money.⁸⁹

8.3.1. Accounted systems. Chapter five distinguished electronic money systems in part based on whether they are accounted or unaccounted systems. In accounted systems, the electronic money issuer maintains a central record of the flow of its electronic money through the economy. In unaccounted systems no such central record exists. Accounted systems are unlikely to present substantial tax administration concerns because the central record of transactions, if it is available for examination on audit, will permit tax administrators to match payments and receipts to specific taxpayers. In fact, the growth of accounted systems will be an advantage for both taxpayers and tax administrators since the central records maintained by an accounted system could be used by taxpayers and auditors to verify payments. Some taxpayers may therefore choose to use accounted systems when a record of the transaction is necessary for tax or other purposes.

Treasury intends to study, and requests comments on, how the records maintained by accounted systems can be integrated into the system of tax administration and the standards that should be applied to determine whether the records maintained by an accounted system are acceptable for tax purposes.

8.3.2. Unaccounted systems. In contrast to accounted systems, problems may arise with unaccounted systems, which maintain no such central record and are therefore analogous to cash. The extent of this problem will be measured by the extent to which unaccounted systems are used instead of accounted systems. It may be that unaccounted systems will be used primarily for certain types of small transactions, just as cash is used primarily for certain types of transactions. In many cases consumers will prefer existing payment mechanisms, such as credit cards, for the payment terms and the consumer protection that they provide. In other situations, consumers will use electronic money but will use accounted systems in order to have a central record in case a dispute arises with the merchant. While unaccounted electronic

⁸⁹It may also be necessary to consider how section 6103, which provides rules governing confidentiality and disclosure of returns and return information, should apply in this context.

systems are unlikely to completely displace other payment systems, the tax evasion potential they create could be substantial.

Transactions using unaccounted electronic money create the opportunity for both not reporting or underreporting the resulting income because detection of these transactions is difficult. For example, a taxpayer might sell physical goods in exchange for unaccounted electronic money, which might be transferred via a card-based system. This problem currently exists for paper currency-based businesses. However, it has been historically possible to examine a business' flow of inventory and similar physical indicia of the magnitude of the taxpayer's business. This may not be possible for a taxpayer who sells electronic goods or services; there is unlikely to be any physical indicia of the amount of the taxpayer's receipts.⁹⁰

8.3.3. **Bank secrecy.** Finally, electronic money creates increased opportunities to deposit unreported income in a bank or other financial institution. As a result of electronic money's advantage in transmitting large amounts of money with relative ease, combined with the continued use of cash, the problem of an underground, unaccounted for economy is likely to be exacerbated.

Electronic money and the Internet substantially increase the ease and safety with which bank accounts can be opened abroad, letterbox companies and trust accounts can be established abroad, and funds transferred anonymously. Unlike paper currency, electronic money can be securely and instantaneously transmitted anywhere in the world. It is now possible to open a bank account over the Internet in a bank secrecy jurisdiction, without actually traveling to the bank's location.⁹¹ Electronic money could be instantaneously and anonymously transferred to such an account, thereby eliminating the risks and reporting requirements involved in transferring cash. Alternatively, a smart card encoded with a large amount of unaccounted electronic money could be slipped into a pocket and taken anywhere in the world without the bulk and weight of cash. However, in the case of a bank or financial institution located in the United States or a country with which the United States has a tax treaty or Tax Information Exchange Agreement, it may be possible in most cases to gain access to the taxpayer's bank records or records of the funds' transmittal.

⁹⁰For example, if a taxpayer sells computer software imprinted on floppy disks, the taxpayer's purchases of blank disks could be used to approximate his gross sales. If the taxpayer sells the same software electronically, a copy is simply transmitted to the purchaser at the moment of sale and no such guidepost exists.

⁹¹A Web site exists which allows the user to open an account with a bank in Antigua. The bank offers multi-currency current and time deposit accounts, numbered accounts, international wire transfers, portfolio management, and "tax protection." Bank secrecy is assured. Such accounts are, of course, subject to the reporting requirements for foreign financial accounts. *See* 31 C.F.R. §103.24.

8.4. Identity verification. A *New Yorker* cartoon once featured two dogs sitting in front of a computer with a caption that read “[O]n the Internet, nobody knows you’re a dog.” Tax administrators face a similar issue. On the Internet it is possible to use a false identity and it is not currently possible to independently verify a party’s identity. This raises a number of issues because the identity of a counterparty is important for numerous tax provisions. For example, if securities are purchased electronically, the issuer is still subject to information reporting and record keeping requirements. If the purchasers are nonresident aliens or foreign corporations, payments of interest and dividends are subject to withholding and reporting. This withholding may be reduced or eliminated by a tax treaty if the beneficial owner is entitled to treaty benefits. Claiming an expense deduction requires proof of the payee and the transaction. Under Subpart F, the identity of the purchaser of goods is relevant in determining whether the sale creates foreign base company sales income. For example, a U.S. seller of electronic goods could route sales through a Web site maintained by a base company and claim that the purchases were for use within the base company’s country of incorporation.⁹² Therefore, it will be necessary to develop techniques to verify that the purchases were indeed for use within that country. Finally, if tax returns and other documents are to be electronically filed, an acceptable form of digital signature will be required.

Verification of identity is also a problem for consumers, who want to be assured that the persons with whom they do business are who they claim to be.⁹³ As a result, companies engaged in electronic commerce are developing “digital certificates” or “digital IDs” that can be used to verify a person’s identity over the Internet.⁹⁴ “Digital certificates” are issued by a trusted intermediary who verifies the identity of a person and performs appropriate background checks, depending on the level of assurance to be granted.⁹⁵ Once a person’s identity has been verified, he is issued a digital ID, which is the on-line equivalent of a driver’s license or passport which can be transmitted to a potential customer. The certificate is created using public key encryption

⁹²See section 954 and Treas. Reg. §1.954-3.

⁹³See e.g., *Digital Signatures Expected to be Necessary for Online Shopping*, Interactive Marketing News, Sept. 13, 1996.

⁹⁴See e.g., <http://www.verisign.com>. The Postal Service is also testing an “Electronic Postmarking Service.” 61 Fed. Reg. 42,219 (1996); See also, <http://www.usps.org>. The Federal Government has adopted a Digital Signature Standard (DSS), 59 Fed. Reg. 26,208 (1994), and a Secure Hash Standard (SHS), 58 Fed. Reg. 27,712 (1993).

⁹⁵For example, one digital signature provider offers three levels of certification. The simplest level verifies that a an e-mail message was sent from an indicated address. The next level verifies the digital ID holder through online identity verification against a consumer database. The highest level requires that the holder personally appear before a notary public to have a digital ID application notarized.

techniques, which makes it independently verifiable by the recipient and immune from tampering.⁹⁶

If they operate as designed, these digital IDs are likely to represent an important means by which taxpayers and tax administrators can prove the identity of electronic counter parties. For example, if it were necessary for tax purposes to prove the identity of an electronic counter party or comply with an information reporting requirement, a taxpayer could be required to obtain a digital ID from the counterparty and maintain a record of that ID which could be examined on audit. However, because some issuers of digital IDs may not perform sufficiently thorough identity checks prior to issuing a digital ID, the IRS may be required to develop standards for issuers of digital IDs and certify issuers. In order to do so, the IRS may be required to issue its own digital IDs to issuers of digital IDs so that they can electronically prove that they have received IRS certification. Treasury requests comments on the extent to which digital IDs can be utilized for tax purposes, including the extent to which they can serve as signatures on electronically filed documents, the extent to which their use should be required for certain purposes, and the role that the IRS should play in certifying issuers of digital IDs.

8.5. Record keeping and transaction verification. Taxpayers are required to keep accurate books and records, which are subject to examination by the IRS in order to verify the income and expenses reported on the taxpayer's return.⁹⁷ Although many taxpayers rely on computerized record keeping systems to a large extent, many transactions still originate as paper records which can be used to verify the accuracy of the electronic records. However, for taxpayers engaged in the sale of electronic goods or services, no paper records are likely to be created because customer orders are placed and fulfilled electronically and therefore the only record that exists of these transactions could be an electronic one. As all users of computers know, this creates the possibility for tax evasion and fraud because computerized records can be altered without a trace.⁹⁸ Even taxpayers engaged in the sale of physical, as opposed to electronic, goods may soon receive orders and issue invoices electronically. Electronic "documents" must be verifiable in order to minimize the potential for tax evasion.

This is also an issue for non-tax businesses reasons. For example, a recipient of an electronic order needs to verify both that the order was sent by the proper person, and also needs to verify that the order was not altered in transit. Public key encryption techniques, which are used to create digital identity certificates, can also be used to verify that electronic documents

⁹⁶The theory of digital signatures is discussed in Chapter 4, *supra*.

⁹⁷Section 6001; *See also*, Notice 96-10, 96 - 7 I.R.B. 47 (electronic imaging of taxpayer records).

⁹⁸Public key encryption (as well as other encryption methods) also permits a taxpayer to encrypt his financial records to prevent their examination on audit. It would seem that this should be treated no differently from failing to keep or destroying paper records.

and records have not been tampered with. For example, “digital notarization” systems have been developed which are intended to make it possible to verify that electronic documents and records have not been altered. One such system purports to provide the digital equivalent of a notary stamp which can be used to certify and seal digital records in content and time so that it can later be proved that the electronic record was created when claimed and was not altered after the fact.⁹⁹

Treasury requests comments on the extent to which such technologies can, in fact, be used to verify the authenticity of electronic transactions and on the role that Treasury should play in the development of these systems.

8.6. Disintermediation and information reporting. Tax reporting and compliance relies in part on the use of centralized institutions and intermediaries that can be used to comply with information reporting and withholding requirements. For example, withholding on payments to foreign persons relies on the use of “withholding agents” who will generally be sophisticated persons who understand their obligations and can be identified, and the ability of the IRS to audit them. As discussed above, it is now possible for individual and relatively unsophisticated taxpayers to engage in cross-border investment and licensing transactions that previously would have taken place through traditional intermediaries, if at all. Disintermediation refers to the elimination of these traditional intermediaries. For example, a payment made for the right to download and reproduce a digitized image may be a royalty, depending on the transferee’s rights.¹⁰⁰ The parties to these transactions may be unfamiliar with their withholding obligations and current technology does not yet provide a means for computing and paying such taxes electronically. Such a system is, presumably, technically feasible but may not be accepted by electronic merchants and consumers. The small amounts involved will also complicate tax administration. In addition, the parties may be unfamiliar with their information reporting requirements. Information reporting plays an important role in tax administration and it may also be necessary to integrate these transactions into our system of information reporting.

⁹⁹For example, one such system is based on a mathematical method called “one-way hashing” which creates a nearly unique “hash value” for each document, based on the arrangement of the characters and graphics elements within it. The hash value is generated using a “hash algorithm” which makes it easy to input the text of a document and generate a unique number, but it is virtually impossible to use the resulting hash value to recreate the original document. (In one system, there are 2^{228} possible hash values, while in contrast the Universe is estimated to contain 2^{280} molecules.) Therefore, it is virtually impossible to create a second document that would yield the same hash value. The hash value is transmitted electronically to a local server, which digitally time-stamps it and stores it. Any document’s hash value can be re-calculated and compared with the original one. Since even the smallest change creates a different hash value, it can be determined whether a document’s contents or time-stamp have been changed. *See*, <http://www.surety.com>.

¹⁰⁰*See* section 3.2.4, *supra*.

Treasury requests comments on how the tax system can be adapted to deal with such disintermediated micro-transactions, and the role of information reporting in such transactions.

9. CONCLUSION

As the communications revolution continues to sweep through the world economy, tax principles and systems of tax administration will have to adapt. This paper represents an attempt to further that process. It is not intended to resolve the tax policy and administration issues posed by the communications revolution but is intended to identify and assess some of these issues. Certain issues may initially appear to be so complex that they cannot be dealt with by existing principles. Further study is likely to result in the conclusion that one or more existing principles are more flexible than they may seem and they remain relevant notwithstanding technological developments. However, some of these technological developments, such as the potential growth of extensive anonymous transactions involving electronic cash, do raise certain existing administration and compliance issues to new levels of concern.

Treasury looks forward to receiving comments from, and working with taxpayers and their advisors, including both tax law specialists and computer technology specialists, academics, and foreign tax policy makers and administrators, to better understand these technologies and develop rational and enforceable tax rules. This can play an important role in fostering the growth of these technologies and transactions. Clear and rational principles will ensure that the tax law will not be an impediment to the growth of these exciting technologies that have such a great potential to improve our lives.

Comments on any of the issues raised by this paper should be addressed to: Joseph H. Guttentag, International Tax Counsel, Department of the Treasury, 1500 Pennsylvania Avenue, NW., Washington, D.C. 20220. Comments may also be submitted to Treasury via Internet e-mail to TAXPOLICY@treas.sprint.com, with the subject line "technology issues." All comments will be available for public inspection and copying

GLOSSARY

Bandwidth: (Also known as “capacity”) In simple terms, how much information or traffic can be carried on the Internet in a given amount of time. The simple rule is that the greater the bandwidth, the greater the opportunities for commerce. As a specific example: with low bandwidth, transferring the contents of a music CD via the Internet is not feasible; with higher bandwidth, it is entirely feasible.

Browser: A program used to access the World Wide Web.

Bit: A contraction of the term “binary digit;” a unit of information represented by a zero or one. The speed of information transmission is measured in bits per second.

CD-ROM: Compact Disc with Read Only Memory; compatible with computers, compact discs are inexpensive, high-capacity storage devices for data, text and video.

Commercial Web Site: A computer site, attached to the Internet, which sells *Internet merchandise*.

Convergence: The “coming together” of formerly distinct technologies, industries or activities; the most common usage refers to the convergence of computing, communications and broadcasting technologies.

Cyberspace: The three-dimensional expanse of computer networks in which all audio and video electronic signals travel and users can, with the proper addresses and codes, explore and download information.

Digital: Information expressed in binary patterns of ones and zeros.

Digital Signature: Data appended to a part of a message that enables a recipient to verify the integrity and origin of a message.

Digitization: The conversion of an analog or continuous signal into a series of ones and zeros, i.e., into a digital format.

Electronic Commerce: Consumer and business transactions conducted over a network, using computers and telecommunications.

Encryption: The coding of data for privacy protection or security considerations when transmitted over telecommunications links, so that only the person to whom it is sent can read it.

Fiber Optic: A modern transmission technology using lasers to produce a beam of light that can be modulated to carry large amounts of information through fine glass or acrylic fibers.

Global Information Infrastructure or GII: The convergence of previously separate communications and computing systems into a single global network of networks.

Hypermedia: Use of data, text, graphics, video and voice as elements in a hypertext system. All the forms of information are linked together, so that a user can easily move from one form to another.

Hypertext: Text that contains embedded links to other documents or information.

Information Superhighway: See Global Information Infrastructure.

Intellectual Property: A collective term used to refer to new ideas, inventions, designs, writings, films and others; protected by copyright, patents, trade-marks, etc.

Internet: A vast international network of networks that enables computers of all kinds to share services and communicate directly.

Internet Merchandise: Goods, services or other property (typically property in which intellectual property rights subsist, such as music, software etc.) sold via *commercial web sites*. A distinction can be drawn between those cases where delivery is effected via the Internet itself (e.g. downloaded software) and where delivery is effected via conventional means.

Internet Service Providers (ISPs): Organizations which provide individuals and businesses with access to the Internet (including *commercial web sites*). ISPs may be wholesalers or retailers or both. A wholesaler normally resells bandwidth and certain other services to smaller ISPs who act as retailers. The most significant component of the sale price is the amount of *bandwidth* purchased.

Modem: A contraction of “mo(dulator)” and “dem(odulator),” an accessory that allows computers and terminal equipment to communicate through telephone lines or cable; it converts analog data into the digital language of computers.

Protocol: A standard procedure for regulating data transmission between computers.

Server: Computers which store information for access by users of a network, including the Internet.

Virtual Reality: An interactive, simultaneous electronic representation of a real or imaginary world where, through sight, sound and even touch, the user is given the impression of becoming part of what is represented.

World Wide Web, Web, or WWW: The graphical, hypertext portion of the Internet. The World Wide Web is described in chapter 3.

FOOTNOTES