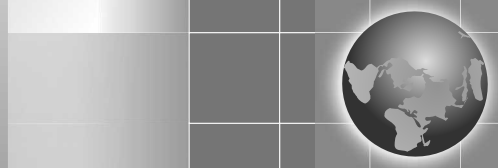
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Transfer of Technology for Successful Integration into the Global Economy

Taxation and Technology Transfer: Key Issues



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United Nations

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NOTE

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Preface

The current study was undertaken in pursuit of UNCTAD's mandate to "identify and disseminate information concerning existing home-country measures that encourage transfer of technology in various modes to developing countries, in particular to the least developed countries" (Bangkok Plan of Action, TD/386, paragraph 118) and "draw lessons from successful experiences with the transfer and diffusion of technology through FDI and other channels" (São Paulo Consensus, TD/410, paragraph 56 and 57).

The report gives an overview of the impact of taxation in developed and developing countries on the transfer of technology and seeks to shed light on the formulation of tax policies that could facilitate technology transfer. The study presents extensive (but not exhaustive) national tax policy options designed to facilitate technology transfer, along with several government initiatives, measures and institutions, as well as incentives provided to industry aimed at facilitating the transfer of technology. The study is intended as a resource for governments, institutions, industries, researchers and policy makers on taxation and technology export and import.

UNCTAD's work in this area is ongoing, and comments on this preliminary study are welcome.

Acknowledgements

This study is part of the series on *Transfer of Technology for Successful Integration into the Global Economy* prepared by DITE/UNCTAD in the context of the work programme on technology transfer and intellectual property rights (TOT-IP). The TOT-IP initiative aims at assisting developing countries to participate effectively in international discussions on technology transfer and intellectual property, and to identify development policy options for enhancing their international competitiveness and successfully integrating into the world economy.

The studies in the series address key policy issues and draw lessons from successful experiences with technology transfer and diffusion in developing countries, the effectiveness of the different modes of technology transfer, and the impact of regulatory policies on technology transfer.

The study series is carried out by a team led by James Zhan that includes Christoph Spennemann, Fulvia Farinelli, Maria Susana Arano, Prasada Reddy and Victor Konde. Monica Adjivon-Conteh and Josephine Ayiku provide administrative assistance.

Khalil Hamdani provides overall direction to the Programme.

This study was prepared by Alex Easson (Professor of Law, Queen's University, Canada) and was finalized by Victor Konde under the supervision of James Zhan and Assad Omer.

The final study reflects comments that were received from Steven Clark (OECD Secretariat), Rory Allan, Kiyoshi Adachi, Joerg Weber, Prasad Reddy and anonymous referees. The study was submitted to the WTO Working Group on Trade and Transfer of Technology (WGTTT) at its twelfth session on 7 July 2005 and benefited from comments by members of the WGTTT.

Contents

Abbreviations

CFC	controlled foreign company
CIT	corporate income tax
ECo	(technology-) exporting firm
EU	European Union
FDI	foreign direct investment
ICo	(technology-) importing firm
IP	intellectual property
IPRs	intellectual property rights
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
PE	permanent establishment
R&D	research and development
TNC	transnational corporation
TOT	transfer of technology
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
VAT	value-added tax
WTO	World Trade Organization

Executive summary

Tax policies in both technology-importing and technology-exporting countries have implications for the form and mode in which transfer of technology takes place. In general, taxation affects technology transfer in two ways: by increasing the cost of the actual transfer, and by reducing the subsequent return to the transferor.

Taxation in importing and exporting countries falls under a number of headings. These include business profits, fees for services, rents and royalties, dividends and capital gains, and employees' salaries.

In the importing country, the tax most likely to affect transfer of technology is the tax on business profits (i.e. the corporate income tax – CIT). Import duties can also affect the importation of technology, especially where the technology takes the form of tangible goods or equipment. Other taxes, such as capital duties, stamp duties and transfer taxes, are also important in some countries. If these tax rates are high, they may impede transfer of technology.

The most important exporting-country tax likely to affect technology transfer is, again, the CIT. In general, exporting countries do not tax the actual transfer of technology. However, tax liability arises on receipt of the returns that accrue from the technology transfer. The fee for the services, the price (or rent) of the equipment and the royalty for use of the patent constitute part of the exporting firm's (ECo's) income for tax purposes in the exporting country. However, there are cases where the transfer itself creates a tax liability. When the transfer involves the disposal of a capital asset (tangible or intangible), it may give rise to a taxable capital gain: if the asset is a depreciable asset, there may be a recapture of some of the depreciation previously claimed.

Most countries (both exporting and importing) have anti-avoidance provisions in their tax legislation. From the importing country's perspective, among the most important provisions related to technology transfer are the transfer pricing rules. The expression "transfer pricing" refers to transactions in goods and services between related enterprises. Transfer pricing legislation seeks to give a country's tax authorities the power to examine the price charged in a transaction between related persons and to replace it with an amount representing the price that would have been charged in a transaction between unrelated persons.

From the exporting country's perspective, income earned by a foreign subsidiary is normally taxed in the home country only when it is remitted to the parent company, or when the parent company becomes entitled to receive it. Home-country tax can consequently be avoided (a) in the case of dividends, simply by not declaring them; and (b) in the case of royalties, rents, fees and the like, as well as dividends, by diverting them to another affiliated company in a country that imposes little or no tax on them. The home country may attempt to counter this by controlled-foreign-company (CFC) legislation, according to which a country taxes its own resident individuals or companies on their proportionate shares of income of non-resident companies and other entities (such as trusts), as that income accrues and regardless of whether it is distributed to them or not.

The formulation of a tax policy with respect to the importation of technology involves the balancing of conflicting objectives. On the one hand, countries wish to facilitate the acquisition of technology: on the other, they wish to derive, in the form of tax revenue, a fair share of the profits that accrue to the foreign owner of that technology by virtue of the transfer. To what extent is the importing country able to tax the various transactions involved in technology transfer without deterring such transfers altogether?

Provision of tax incentives is considered inefficient in theory because they cause distortions: investment decisions are made that would not have been made without the inducement of special tax concessions. In practice, the incentives are considered both ineffective and inefficient. They are ineffective in that tax considerations are only rarely a major determinant in foreign direct investment (FDI) decisions; they are inefficient because their cost, in terms of tax revenue forgone, often far exceeds any benefits they may produce. They are also inequitable (since they benefit some investors but not others), are difficult to administer and are open to abuse. To the extent that tax considerations do play a part in investment decisions, it is commonly claimed that the general features of the host country's tax system are more important to potential investors than are special incentives. However, there is also substantial evidence that tax incentives are an important factor in some types of investment decisions.

Careful targeting of investment incentives can increase their effectiveness and reduce their inefficiency. If tax incentives are to be used, an initial issue that confronts policy makers is to decide *which* enterprises or activities should qualify. For instance, many countries offer generous tax incentives to high-technology investors because these industries are seen as especially desirable for providing employment, boosting exports and modernizing the economy. An alternative approach is to confer tax privileges on investments that meet one or more of a number of listed criteria. Several countries have developed the concept of "pioneer" industries, with qualifying industries receiving preferential tax treatment.

Attempting to promote technology transfer by favouring hi-tech industries has its limitations, since many conventional industries use advanced technologies, the introduction of which could be equally (or perhaps more) beneficial to the host country. An alternative approach is to require actual transfer of technologically advanced equipment, rather than simply favouring hi-tech industries. Nevertheless, this approach, too, can pose problems. In the case of foreign investment, the equipment remains the property of the investor and is often retained under the control of foreign technicians, so that there is no real transfer of *technology*.

From the perspective of technology-exporting countries, tax policy also requires the balancing of objectives. They wish to encourage their enterprises to exploit their technologies abroad and thereby increase their ability to earn income. At the same time, they wish to derive tax revenue from what they consider to be a fair proportion of the profits resulting from the export. These two objectives can conflict, and tax rules designed to protect the domestic tax base can create disincentives to transfer technology abroad.

As is the case in technology-importing countries, a number of the exporting countries' tax provisions may have implications for technology transfer. Particularly important are immediate tax liability occasioned by the transfer, transfer pricing rules, disallowance of expenditures incurred in creating the technology and failure to allow tax-sparing credits.

In recent years, the international community has focused on whether developed countries' tax systems might do more to facilitate and encourage investment in developing countries and thus promote transfer of technology. Various measures have been considered, including the adoption of tax-sparing credits and tax exemptions for business income earned in developing countries, particularly in sub-Saharan Africa.

Perhaps the most effective approach for technology-exporting countries would be to tailor tax policy to facilitation of FDI in developing countries generally, in the expectation that increased technology transfer will be among the benefits flowing from such investment.

Introduction

Technology is considered an essential precondition for improving productivity, attaining industrial development and promoting export growth. Therefore, technology transfer is seen as a key element for enabling developing countries to integrate into and compete in the global economy as well as to meet their development goals.

Transfer of technology has been defined as the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service (UNCTAD, 1985). Most of the world's technological progress takes place in about 20 countries: it is then transferred to other parts of the world through international trade, cross-border education and FDI (Margalioth, 2003).

Technology exists in different forms and can be transferred through different channels. The various forms of technology can be grouped into three categories: tangible assets, intangible property, and knowledge and skills. These different forms of technology can be transferred from one country to another in various ways. The transfer may take place through a change of ownership, through licensing or leasing, or through the provision of services. Payment for the transfer can be made through a sale price in money (or in the form of an item of property, such as the shares of a corporation), through some type of recurring rental payment (e.g. a royalty), or through a fee for services rendered. These various methods of transferring technology have different tax consequences in both the transferring country and the recipient country (Brown, 1990; Schneider, 1995).

Tax policies in technology-importing (host) countries as well as in technology-exporting countries (in some cases even in third countries acting as intermediaries) have implications for the form and mode in which transfer of technology takes place. In general, taxation affects technology transfer in two ways: (a) by increasing the cost of the actual transfer, and (b) by reducing the subsequent return to the transferor.

This report examines the implications of various tax instruments used in technology-importing and -exporting countries for transfer of technology and analyses how fiscal policy in developed and developing countries might be adapted to promote transfer of technology to developing countries. The report analyses several examples of international and national taxation policies and their potential impact on transfer of technology.

Although the main focus of this study is on the promotion of technology transfer to developing countries, it is important to remember that many developed countries are net importers of technology, and that some developing countries are themselves exporters of technology. Consequently, when considering the formulation of tax policy, it seems more appropriate to draw a distinction between technology-importing and -exporting countries than between developed and developing countries.

The report is organized as follows: Chapter I discusses the ways in which international tax principles apply to and affect technology transfer. Chapter II examines key issues in formulating a tax policy that promotes transfer of technology. Chapter III analyses the tax policies of technology-importing and -exporting countries and how these could be adapted to facilitate transfer of technology to developing countries. A final section provides concluding remarks.

Chapter I
The application of international tax principles to technology transfer

The forms of technology can be grouped into three categories: *tangible assets*, *intangible property* and *knowledge and skills*. There are borderline cases that may be difficult to categorize. Software, for example, can be delivered in tangible (shrink-wrapped) form or electronically.[1] Know-how may be considered an item of property in one country but not in another.

These different forms of technology can be transferred from one country to another in various ways. The transfer may take the form of a change of ownership, of some form of licensing or leasing, or of the provision of services. Payment for the transfer may take the form of a sale price in money (or in the form of an item of property, such as the shares of a corporation), of some type of recurring rental payment (e.g. a royalty) or of a fee for services rendered. The type of property, the method of transfer and the method of payment may all affect the tax treatment of the transfer.

1. Basic international tax principles and international treaties

There exists a generally recognized set of tax principles that are applicable to international transactions. Although nothing comparable to a national tax system exists at the supranational level, it is possible to identify a number of basic international tax concepts that are recognized by the great majority of countries (Avi-Yonah, 1996).

The past three decades have seen considerable convergence of national tax systems, resulting in part from the work of various international bodies and in part from spontaneous responses to similar pressures (Easson, 1999; Stewart, 2003). Of the international organizations, the World Trade Organization (WTO) has had a wide and direct impact on national tax rules. Until recently, the GATT/WTO rules were restricted to issues of international trade in goods and applied only marginally to most forms of technology transfer. The rules affect principally customs duties and procedures and, to a lesser extent, consumption taxes. However, the agreements reached in the course of the Uruguay Round may have important application to direct taxes as well, in particular the use of tax incentives as a form of export subsidy.

Among other organizations, the influence of the Organisation for Economic Co-operation and Development (OECD) has been felt strongly in connection with its role in formulating a model treaty for the elimination of double taxation. Its Committee on Fiscal Affairs has also been a persuasive force in promoting the adoption of common tax principles among member countries and among other countries to which it has provided assistance.

1 Electronic delivery of goods and services presents numerous problems for tax administrations. See Owens, 1992; Cockfield, 2003; Li, 2003.

Worldwide, the total number of double taxation treaties is close to 2,300 (UNCTAD, 2004). Virtually all of these closely follow the OECD Model or the UN Model (which is in turn based on the OECD Model but has been adapted to meet the special needs of developing countries).[2] Together, the OECD and UN models have greatly influenced not only inter-state tax arrangements but also the design of those parts of domestic tax systems that apply to income generated by international trade and investment.

The interaction between importing-country and exporting-country tax rules may result in international double taxation. Double taxation is sometimes, but usually not entirely, eliminated unilaterally by the exporting country through the foreign tax credit mechanism. However, that mechanism is not very effective when the double taxation results from dual residence, different interpretations of "source", or different classifications of income, the latter being especially problematic in the case of technology transfer (van der Bruggen, 2001). Tax treaties attempt to eliminate double taxation in such cases by adopting common jurisdictional rules and definitions.

In the context of technology transfer, one of the most important functions of tax treaties is to reduce the rates of withholding tax that are imposed by the importing country on payments of royalties, technical fees and the like. Those provisions, while primarily intended to allocate taxing power between the states, in some cases also help to eliminate (or reduce) double taxation. Furthermore, close cooperation between the tax authorities of parties to tax treaties helps develop common tax definitions and classifications that reduce ambiguities among the tax rules of countries.

Even without the impetus provided by international organizations, the tax policies of most countries have over the past two decades exhibited many common trends. This has been reflected in the almost universal adoption of the value-added tax (VAT) as a major source of tax revenue, partly in place of less neutral types of consumption taxes and partly in preference to highly progressive personal income taxes. In terms of taxation of business profits, the trend has been towards lower marginal rates, a broader tax base and greater neutrality regarding different types of businesses and activities. As a result, many countries have restructured their tax systems unilaterally, rather than as a result of any concerted or coordinated international plan or programme.

The following sections briefly review the application of these general principles to transfers of technology.[3] However, it must be emphasized that, though these principles are widely recognized, details vary substantially from one country to another.

2. Taxation in the importing country

The most important of the importing country's taxes, insofar as technology transfer is affected, is usually the tax on business profits, referred to here as the corporate income tax

2 See the United Nations Model Double Taxation Convention between Developed and Developing Countries (http://unpan1.un.org/intradoc/groups/public/documents/un/unpan002084.pdf).

3 A comprehensive review is provided in the International Fiscal Association's report of its 1997 conference (IFA, 1997).

(CIT). [4] Personal income tax and social security contributions are of little relevance, except in the case of employment of expatriates (discussed further in Chapter II).[5] Sales taxes, such as the VAT, should normally be of little concern.[6] However, import duties can be a major obstacle to the importation of technology, especially where the technology takes the form of tangible goods or equipment. Other taxes, such as capital duties, stamp duties and transfer taxes, can also be important in some countries.

Taxation in the importing countries affects the transfer of technology in two ways: by increasing the cost of the actual transfer, and by reducing the subsequent return to the transferor.

(a) The cost of the transfer

Transfers involving the importation of tangible assets, such as machinery or equipment, frequently lead to the imposition of import duty. For fairly obvious reasons, the transfer of intangible property usually attracts no import duty, though it ought to be subject to VAT.[7] Since the importer receives a credit for that tax to set against its own VAT liability, the tax does not normally increase the cost of the transfer.[8]

In the case of a straightforward sale of assets (tangible or intangible) by the exporting firm (ECo) to the importing firm (ICo), there is often no further tax consequences in the importing country, though sometimes that country imposes some form of transfer tax, which increases the cost of the transfer. The sale may also give rise to a gain, realized by the ECo, but that gain is normally not taxable in the importing country except when the ECo is considered to be resident, or to have a permanent establishment, there. (In that case, the gain may be treated as part of the Eco's business profits and be taxed as such, or it may be taxed separately as a capital gain.) In practice, the transferred assets, whether they are tangible assets such as machinery or intangibles such as patent rights, will often have already been used by the ECo and will have lost some of their original value, so that no gain arises.

As an alternative to selling assets for cash, the ECo may contribute them to the capital of the ICo in return for shares in the ICo. That often occurs where the ICo is formed as a subsidiary of the ECo or is a joint venture in which the ECo has a substantial interest. Technically, the transaction remains a sale, the compensation being the shares received, and the "sale price" is normally taken to be the value of the shares received. Again, the transfer

4 Withholding taxes on non-residents can be considered part of the CIT system though they can, of course, also apply to payments made to individuals and corporations. However, technology transfer occurs almost exclusively between corporations.

5 Technical services may also be provided by self-employed individuals. For the most part, this situation differs little from one where the services are provided by a corporation, except that the tax rate may be different.

6 Problems do occur where the transfer takes the form of a cross-border provision of services, especially where the countries concerned have different rules for determining the place of supply.

7 Payments (e.g. royalties) for intangible rights that relate to imported (tangible) goods are subject to import duties in some countries; see, for example, the treatment of such rights in China (Fletcher and Shu, 2003).

8 The situation is different when the importer is not a taxable person for VAT purposes (e.g. is a non-profit research establishment). In that case there is no output VAT against which to claim a credit.

may give rise to a gain, which may be taxable in the importing country but more often is not.[9] In many countries, contributions to a company's capital attract some form of capital tax or stamp duty. It is also not uncommon for there to be restrictions on contributions in kind to a company's capital. (For details see Chapter II.)

A third method of transferring assets is to lease or license them in return for recurring payments in the form of rents or royalties. The transfer may again attract transfer taxes and/or taxation of any gain. The taxation of the recurring payments will be considered in the next section.

It is important to note that if the ECo and the ICo are related parties – for example, parent company and subsidiary – transactions between them may be subject to review under transfer pricing legislation (see section 3 (a).

(b) The return on the investment

Where TOT takes the form of a lump-sum sale of assets to an unrelated party, the tax consequences are normally limited to those described above. In most cases, however, TOT has ongoing tax implications. Where assets are transferred as part of the contribution of capital to a subsidiary or affiliate company, the transferor (ECo) will expect to receive a return on the investment in the form of dividends and perhaps a capital gain on the eventual disposal of its shares in that company. Where assets are leased or licensed to the transferee (ICo), whether it is related to the ECo or not, the ECo will expect to receive royalties or rental payments.

Not every TOT takes the form of a transfer of assets. In many cases, the ECo will provide technical services of one sort or another to the ICo in return for a fee or some other form of payment, such as a share of profits. (There are also instances where the TOT takes the form of a transfer of assets *and* the provision of services.) The provision of services may involve an extended presence in the importing country, or no presence at all.

Taxation in the importing country of the various types of payment falls into a number of categories. These include

- business profits
- fees, rents and royalties
- dividends and capital gains
- employee salaries

In determining how the various payments are to be taxed, it is first necessary to establish whether the ECo is considered to be carrying on business in the importing country. Although there is a generally recognized distinction between doing business *with* a country and doing business *in* that country, many countries have adopted very broad definitions of what constitutes conduct of business, so that very little physical presence (and sometimes no physical presence at all) is required in a country in order to render a non-resident liable to tax on business profits considered to have been derived from that country. However, where a tax

9 See Chapter II, section 3b below.

treaty is applicable, the right of the importing country to tax business profits is usually restricted to cases in which the non-resident (ECo) has a *permanent establishment* (PE) in that country, and is restricted to the profits that are attributable to that PE. Article 5 of the OECD Model Treaty defines "permanent establishment" in some detail as "a fixed place of business" through which the business of an enterprise is carried on, and which may be "a place of management, a branch, an office, a factory, a workshop and a mine, an oil or gas well, a quarry or any other place of extraction of natural resources". In addition, the PE may be a building site or construction or installation project, provided it lasts for more than 12 months. A subsidiary does not by itself constitute a PE of its parent company.[10]

The taxation of PE profits varies widely from country to country. Not only do CIT systems differ substantially (in aspects such as the tax rate, the computation of taxable profits, and details such as the carry forward of losses), there is also the problem of determining what part of the taxpayer's profit should be attributed to the PE. The objective in most systems is to treat the PE as if it were a separate entity, essentially similar to a subsidiary of the foreign parent. The problem, however, is that a PE is not a separate person: it is an integral part of the operations of the enterprise as a whole. Having no separate personality, it cannot enter into contracts with its head office, make payments to it, or transfer property to it: the funds or property already belong to the enterprise, and any "transfers" are for internal bookkeeping purposes only.

Two approaches to the problem may be taken (Burgers, 1995). One approach is to treat the branch as a fictional separate entity engaged in dealings at arm's length with its own head office and with others. The PE is treated as if it had bought and sold goods from and to its head office and had borrowed money and paid interest, rent, management fees and the like, in each case charging or paying a notional arm's length price. The alternative approach is to accept the unity of the enterprise and simply allocate or apportion various items of revenue and expenditure to the PE or the rest of the enterprise as appropriate. Whichever approach is used, actual application is very difficult.

Fees for services, whether these are provided by a non-resident company, a self-employed individual or some other entity such as a partnership, are normally included in business profits if the recipient of the fees carries on business in the importing country,[11] but they may otherwise escape tax there altogether (being treated essentially in the same way as payments for goods supplied by a non-resident). Alternatively, such payments may be treated much like royalties and be subject to withholding tax.

Withholding tax is normally imposed as part of the general income tax law of a country. The tax commonly applies to a wide range of payments made to non-residents – dividends, interest, royalties, rents, management fees, technical fees, fees to non-resident contractors or consultants, and other payments of a similar nature. In some countries, a single flat tax rate applies to all such payments; in others, different types of payment are taxed at different rates. Rates tend to be quite high, often around 25 to 30 per cent or even higher. However, exemptions for certain types of payments are common, and the rates are usually reduced substantially where a tax treaty is applicable.

10 The UN Model Treaty provides a somewhat broader definition.

11 Through a PE, where a tax treaty is applicable.

According to the OECD Model, royalties are defined as “payments of any kind received as a consideration for the use of, or the right to use, any copyright of literary, artistic or scientific work, including .... any patent, trade mark, design or model, plan, secret formula or process, or for the use of, or the right to use, industrial, commercial or scientific equipment, or for information concerning industrial, commercial or scientific experience". The definition is very broad and would seem to embrace virtually all forms of payment for all forms of technology. However, it should be remembered that the intention of the OECD Model was to *exempt* such payments from tax in the source country (hence the broad definition). In practice, although complete exemption of royalties is the exception rather than the rule, most tax treaties contain a somewhat narrower definition of those royalties that may be subject to withholding tax. The precise definition, in domestic legislation and in individual treaties, is therefore especially important in determining whether a particular payment is taxable. Questions frequently arise, for example, as to whether equipment rentals or payments for computer software constitute royalties or form part of the business profits of the payee, or should be regarded as some other form of income, which may or may not be subject to tax.

A common method of foreign investment involves the establishment in the host country of a subsidiary or an affiliated company. Technology might be supplied to the subsidiary, and paid for, in any of the ways described above. Alternatively, it might be contributed as part of the capital of the subsidiary. In addition to any royalties, rental payments and fees that may have been agreed on, the parent company (ECo) may receive dividends from its subsidiary (ICo) and may realize a capital gain if it eventually disposes of its shares in the subsidiary.

Normally, dividends are subject to withholding tax in the importing country, though tax treaties commonly reduce the tax rate to as little as 5 per cent or eliminate it entirely. As for the disposal of shares, some countries do not tax capital gains at all, or tax only a very limited range of gains, such as short-term gains on land and listed securities. Others tax capital gains fully, at the same rates as other types of income. In between, various other possibilities exist. It is common, for example, for gains realized on the disposal of business assets to be treated as part of the profits of the business, but for other types of gain to receive special treatment or exemption. The OECD Model allows the host country to tax capital gains of a non-resident derived from the disposal of immovable property and of movable property forming part of the business property of a PE. The UN Model goes further, permitting the host country to tax gains on the disposal of substantial shareholdings.

Technology transfer often involves the ECo sending employees to provide technical or management services to the ICo. In some cases, the employee remains on the payroll of the Eco; in others, especially where the ICo is a subsidiary of the ECo, the individual may become a (temporary) employee of the ICo. In either case, his or her remuneration will constitute employment income derived from duties performed in the host country and will normally be subject to personal income tax there. However, where the employment is for a relatively short term (e.g. not exceeding six months), tax treaties frequently provide an exemption from host-country tax.

(c) Anti-avoidance rules

Most countries have some sort of general provision in their tax legislation intended to nullify tax planning schemes that are considered unacceptable, or recognize a general “abuse

of legislation" doctrine that can be used to counter tax avoidance. In addition to such general provisions, there are various types of specific anti-avoidance provision. Of these, the most important from the perspective of TOT are transfer pricing rules.

The expression "transfer pricing" refers to transactions in goods and services between related enterprises. Virtually all developed countries and many developing countries have some sort of transfer pricing provisions in their tax codes. Legislation in some countries is complex and highly detailed: in others, the legislation consists of a single simple provision. However, all transfer pricing legislation seeks to give the tax authorities of the country the power to examine the price charged in a transaction between related persons and to substitute for it an amount representing the price that would have been charged in a transaction between unrelated persons. Consequently, all transactions between a company importing technology (ICo) and a parent or affiliated company are reviewable. Such transactions include not only supplies of materials, components and finished products but also payments for intangibles, such as management fees, patent royalties, payments for technical assistance and know-how, and the like.

3. Taxation in the exporting country

As is the case with the importing country, the most important tax affecting TOT in the exporting country is usually the corporate income tax (CIT). CIT is often the only tax that has any real relevance to the export of technology. Relatively few countries now impose export taxes (and then only on scarce natural resources), and VAT is (or should be) remitted on the export of goods and services.

As with importing countries, taxation affects TOT in two ways: by increasing the cost of the actual transfer, and by reducing the real return to the transferor.

(a) The cost of the transfer

Very often no tax cost is occasioned in the exporting country by the actual TOT. However, tax liability arises only on receipt of the consideration for the transfer. The exporter (ECo) can send its employees abroad to provide services to a client, or may provide technical assistance to the client (ICo) without even stepping outside its home office. The ECo may sell to the ICo equipment that it has manufactured, or may grant a licence to use a patent that it owns. The fee for the services, the price (or rent) for the equipment, or the royalty for use of the patent will constitute part of the ECo's income and may be taken into account in determining its taxable profits in the exporting country. But the actual transfer itself will often be entirely costless from a taxation perspective.[12]

However, there are cases where the transfer itself leads to a tax liability. When the transfer involves the disposal of a capital asset (tangible or intangible), it may give rise to a taxable capital gain: if the asset is a depreciable asset, there may be a recapture of some of the depreciation previously claimed.

Immediate tax liability tends to depend on whether the asset in question remains in the ownership of the transferor. In the case of a sale of a tangible asset, there is a disposal of the asset and a potential liability to tax on any capital gain, or to recapture of depreciation

12 In some cases there may be a transfer tax or stamp duty.

allowances.[13] If, instead, the asset is leased, there will (in most tax systems) be no disposal for capital gains and depreciation purposes, and no immediate tax consequences.[14] That, however, may depend on the terms and length of the lease: a distinction is often made between operating leases and finance leases (where the intention is for the lessee to eventually acquire ownership of the asset). The situation is more complex for transfers of intangible property, such as patent rights. Intangible property, like tangible property, is usually regarded as capital property, and its disposal may therefore give rise to a capital gain or loss: in many tax systems it is treated as depreciable property, so that disposal may result in the recapture of depreciation allowances already claimed. A particular difficulty is that intellectual property rights (IPRs) are divisible and can be assigned or licensed in a variety of ways. Patent rights may be assigned outright (i.e. the ECo relinquishes all rights to the patent), the rights may be assigned in part (as where the ICo is given sole rights to exploit the patent in a particular country or region) or may simply be licensed (with the ECo retaining full rights to use the patent, and the ICo being given concurrent rights within a particular country or region). The latter situation usually does not give rise to any immediate tax consequences, whereas the first two (disposal and part disposal) may do so.

A further situation to consider is that where the ECo contributes property (tangible or intangible) to the capital of the ICo in return for shares in the ICo. Such a transaction may be treated in the same way as any other disposal of the property, in which case the property will usually be considered to have been disposed of at a price equal to its fair market value, which value will also become the acquisition cost of the shares.

(b) The return on the investment

Taxation in the exporting country tends to become a more important factor when one considers the income that is derived from TOT. Most countries claim the right to tax their own residents on their global income. An enterprise that is resident in one country and derives income from another country can consequently expect to be taxed in its home country as well as in the host country. There are, however, a few exceptions to this rule and numerous partial exceptions, with the result that there is often no home-country liability for several reasons. The main reasons are that (1) a few countries apply a "territorial system" and do not tax foreign-source income at all; (2) other countries exempt from tax certain types of foreign-source income; and (3) the methods used to eliminate double taxation may result in there being no additional tax liability in the home country.

In practice, the territorial system is now relatively rare. Among major capital-exporting countries, Hong Kong (China) is unique in having a purely territorial tax system. Companies resident in Hong Kong, whether locally owned or controlled by non-residents, are taxed only on income arising in or derived from a source in Hong Kong. France and Malaysia are unusual in that they apply the territorial principle to their companies (but not to resident

13 There may, of course, be a capital loss, or a "terminal loss" for depreciation purposes, in which case the transferor obtains a tax advantage.

14 The transferor may, since it still owns the property, be entitled to continue to claim depreciation. This sometimes produces a very advantageous situation for the transferor since, in the early years, the depreciation that the transferor is entitled to claim may exceed the (taxable) rent it receives. The United States has introduced special rules (called "Pickle lease" rules) to restrict this advantage.

individuals), though there are important exceptions to this rule in France. In addition, there are "tax havens" and countries that have established special holding company or "offshore" company regimes, under which qualifying companies are exempt from tax, or pay tax at a very low rate, on various types of foreign-source income.

A second group of countries do not adopt a general territorial approach but nevertheless exempt from taxation foreign-source business profits. The method of exemption varies widely. The Netherlands effectively exempts income attributable to a foreign branch by allowing a proportionate deduction of that income from total worldwide profits; Belgium unilaterally exempts 75 per cent of such profits, and many of its tax treaties provide for full exemption; Germany, too, normally provides for full exemption by treaty; Australia exempts business profits derived from certain listed countries, in which the profits will normally have been taxed at rates comparable to those imposed in Australia; and Singapore taxes such profits only if they are remitted to Singapore. Additionally, many countries provide an exemption in the case of dividends received by a company from a foreign affiliate, especially if these are derived from an active business carried on in the source country. In the Netherlands, the "participation exemption" effectively provides an exemption for all inter-affiliate dividends; Australia and Canada exempt such dividends if they are received from a listed country; Germany grants an exemption where the dividend is received from a country with which Germany has a tax treaty (and also from certain less developed countries). Consequently, dividends can frequently be remitted to the home country without additional tax liability.

Finally, where no exemption applies, it is usual to grant a credit for the tax already paid in the source country in respect of the income: there will consequently be many cases where no home-country tax is imposed, because the source-country tax is equal to or greater than the tax that would be imposed in the home country on an equivalent amount of income.

Taxation of the various types of payments, if they are taxable at all, falls into a number of categories:

- business profits
- fees, rents and royalties
- dividends and capital gains
- employee salaries

As was noted in section 2 of this chapter, the ECo may be considered to be carrying on business in the importing country, depending on the degree of its presence in that country and the manner in which the technology is transferred. However, the ECo will invariably also be carrying on business in the exporting country and, subject to the possibility of an exemption (considered above), will be liable to tax there on its worldwide profits. For the purposes of importing-country taxation, it is necessary to compute the amount of profit attributable to the activities conducted there, and that is done according to the importing country's rules and accounting practices. However, for exporting-country purposes, no separate calculation is normally necessary: the global profits of the enterprise are calculated according to its home-country principles. (There may be special rules regarding the deductibility of expenses incurred to earn foreign-source profits.) One consequence of this is that the amount of the importing-country profits that is reflected in the global enterprise profit may differ substantially from the amount that is separately taxable in the importing country. A further important consequence of this approach is that importing-country losses automatically reduce

the global amount of profit taxable in the exporting country, unless there is any special limitation on the deduction of foreign losses.

In those exporting countries that do tax foreign-source business profits, payments such as equipment rentals, patent royalties, payments for know-how, and technical fees are normally included in the taxable income of the ECo, without the need for special categorization (i.e. are treated as part of the profits of the business).

In cases where technology is transferred to a foreign subsidiary (ICo), part (or all) of the return on the investment may take the form of dividends paid to the parent ECo. Unlike business profits, dividends from an affiliate are not normally taxable until they are declared and remitted to the parent company (the “deferral principle”). As was noted above, even in countries where foreign-source business income is not generally exempt, dividends received from foreign affiliates often are. Otherwise, they will be included in the taxable income of the ECo, though they may be taxed separately from its business income and according to different rules.

The subsequent disposition of its shares in the ICo may also produce a capital gain for the ECo, taxable in the exporting country. Again, capital gains are sometimes taxed separately from business income.

TOT often involves executives and technicians leaving their home country, normally temporarily to install and service equipment, demonstrate techniques, or run an operation until local managers and technicians can be trained. Such persons are often referred to as "expatriates".

Employees sent to the importing country frequently remain resident, for tax purposes, in the exporting country if the stay abroad is for less than one year. Often, an absence abroad of as much as three years is required in order to establish non-residence. In some cases the salary is paid by the ECo, in others by the ICo. In either case, the employee may be liable to personal income tax on his or her salary in the exporting country.

(c) Relief from double taxation

There are two types of double taxation: *juridical* double taxation and *economic* double taxation. Juridical double taxation occurs when a single person is taxed on the same income by two or more countries. Economic double taxation occurs when two separate persons are each taxed on the same income.

There are three principal ways in which international double taxation arises: when a person (natural or legal) is regarded as being resident in two (or more) countries; when an item of income is considered by two (or more) countries to derive from a source in that country; and when a person resident in one country receives income derived from a source in another country. All three situations can arise in connection with TOT. Double taxation may be eliminated unilaterally (by either country) or bilaterally (by agreement between countries).

In the first two types of situation, unilateral relief from double taxation is not feasible, but, as was noted in section 1 of this chapter, tax treaties frequently resolve the problems.

Most countries now provide unilateral relief in the third type of case (where income with a source in one country is received by a person resident in another country) even when there is no tax treaty between the two countries. Most often, the residence country (i.e. the technology-exporting country) grants a credit for tax paid in the source country (the technology-importing country). The amount of the credit is invariably limited to the amount of residence-country tax that would otherwise be payable: that is, no refund of source-country tax is given, but if the tax paid in the source country exceeds that which would otherwise be payable in the residence country, there is no additional residence-country tax. Such, at least, is the theory. In practice, there are various restrictions on granting the credit, or differences between countries in the way that taxable income is calculated, with the result that often some element of double taxation remains.

(d) Anti-avoidance rules

For the exporting country, because of double tax relief and the deferral principle, TOT often yields comparatively little tax revenue. Nevertheless, like technology-importing countries, exporting countries are concerned with protecting their tax base through anti-avoidance rules. In some respects, notably transfer pricing, the concerns of both countries are similar, but in other respects, different considerations may apply. The principal concern of the exporting country is to make sure that potentially taxable income, such as dividends, royalties, rents and fees, is held offshore and is not repatriated.

According to general international tax principles, income earned by a foreign subsidiary is only taxed in the home country when it is remitted to the parent company, or when the parent company becomes entitled to receive it. Home-country taxation can consequently be avoided (a) in the case of dividends, simply by not declaring them; and (b) in the case of royalties, rents, fees and the like, as well as of dividends, by diverting them to another affiliated company in a country that imposes little or no tax on them. The home country may attempt to counter this by controlled-foreign-company (CFC) legislation.

Most developed countries and a few developing ones have adopted CFC rules. Although those rules vary greatly in detail, they follow the same basic approach: a country taxes its own resident individuals or companies on their proportionate shares of the income of non-resident companies and other entities (such as trusts) as that income accrues and regardless of whether it is distributed to them or not.[15] Most countries that have adopted CFC rules apply them only to "passive" income and to what is termed "base company income". Consequently, some types of income derived from TOT fall outside the scope of most CFC rules. However, royalty income is caught (as base company income) in many countries, as is income from the provision of services provided by the CFC to related parties or to persons outside the country in which the CFC is situated. Thus, the rules may prevent the income earned from TOT from being retained in a tax haven or a low-tax jurisdiction and thereby avoiding home-country taxation.

15 Normally, the foreign company (or other body) must be controlled by residents of the home country, and only shareholders with a fairly large participating percentage are subject to the rules. Some countries apply their CFC rules only to subsidiaries located in low-tax jurisdictions. On CFC rules generally, see Arnold and Dibout (2001).

4. The use of third-country intermediaries

TOT often involves more than two countries. Between the ECo, in the exporting country, and the ICo, which may be a subsidiary or affiliate in the importing country, there may be interposed one or more intermediate companies located in other countries. Sometimes the reasons for structuring the operation in this way have nothing to do with taxation; sometimes they are entirely tax-motivated; and sometimes the structure is dictated by non-tax considerations but taxation plays an important part in determining the actual location of the intermediary (Easson, 1999).

An intermediate holding company may be used to enable dividends to be shifted from ICo to a country other than that where the ECo is located, or to enable capital gains to be realized in that other country on the disposal of shares in the ICo. Other types of payment may also be redirected: loan interest payments, rental payments and royalties, and payments for equipment or technical services may be made by the ICo to the intermediate holding company rather than directly to the ECo. Transnational enterprises frequently make use of "centres" – coordination centres,[16] distribution centres or financing centres. Research and development centres may be established to conduct R&D on behalf of all members of the group. Inellectual property may be transferred to a licensing centre, which in turn licenses the technology to other members of the group.

The establishment of such an intermediary may have a number of tax advantages. The intermediary may be located in a country that has a favourable tax treaty with the eventual importing country, thus reducing the rate of withholding tax imposed by that country. Similarly, it might take advantage of a tax treaty with the original exporting country, perhaps enabling profits to be repatriated as tax-free dividends.[17] The chief advantage, however, is that various types of income can be held in the intermediate country and from there redirected to finance other parts of the group's activities, rather than being repatriated to the ECo in the home country, where it would be subject to tax. Fortunately (for the transnationals), a wide range of locations offer low-tax or no-tax regimes for such activities.[18]

16 Such as operational headquarters (OHQ) or regional headquarters (RHQ) companies.

17 There may be other reasons. For example, some US TNCs have reportedly moved their IP licensing activities offshore mainly to avoid the considerable expense and inconvenience of complying with US transfer pricing requirements (Lev, 2002).

18 For example, Cyprus has an extensive network of tax treaties, many of which feature a zero rate of withholding on royalties, and it provides a special regime for international companies, with a low (4.25 per cent) tax rate (Bevir, 2001). The number of suitable locations is shrinking as a result of initiatives by the European Union and the OECD to counter harmful tax competition.

Chapter II
Formulating a tax policy to promote technology imports

1. General considerations

Formulating a tax policy regarding the importation of technology involves balancing conflicting objectives. On the one hand, countries wish to facilitate the acquisition of technology: on the other, they wish to derive, in the form of tax revenue, a fair share of the profits that accrue to the foreign owner of that technology by virtue of the transfer. To what extent is the importing country able to tax the various transactions involved in TOT without deterring such transfers altogether?

The importing country's regular tax system may include features that have a particular (negative) effect on TOT. Making exceptions to the normal tax rules in order to promote TOT may create undesirable distortions and undermine the integrity of the tax system in general, as well as giving rise to difficult issues of classification and interpretation and perhaps providing opportunities for tax avoidance. Exceptions and derogations have costs; to what extent does the promotion of TOT justify those costs?

An important consideration is that, for most developing countries, TOT occurs predominantly in the context of FDI. While FDI does not necessarily result in TOT, relatively little TOT takes place outside the foreign investment context. Consequently, the host-country tax regime, as it applies to FDI, is of vital importance to TOT.

It seems appropriate, therefore, to begin with a brief examination of the taxation of FDI generally. Are there aspects of the regular tax system that constitute particular obstacles to TOT and that may thus require modification? And is there a case for providing especially favourable tax treatment (i.e. incentives) in order to promote TOT?

2. Taxation of foreign direct investment

(a) The relevance of taxation in FDI decisions

To what extent does taxation affect FDI decisions? That question has been the subject of a vast number of studies over the past 30 years or so, and the answers have differed widely (Ruding, 1992; OECD, 2002a). As a broad generalization, it seems that tax considerations play little part in the initial decision to invest abroad, may play a more important role in locational decisions, are more important for some types of investment than for others, and are growing in importance.

As the findings of many studies indicate, tax levels and rates in potential host countries generally only come into consideration once the decision to invest abroad has been made. They are a relevant, though rarely a major, factor in deciding where a particular investment should be located. To quote from one recent review of studies extending back over almost 50 years:

"In general, these surveys confirm the conclusions...that if tax policy matters, then it is not the most influential factor in the site selection of transnationals.... Most econometric studies tend to confirm the results of surveys: that investors are mostly influenced in their

decisions by market and political factors and that tax policy appears to have little effect on the location of FDI" (Morisset and Pirnia, 2001).

Some studies also conclude that the importance of host-country taxation varies considerably according to the type of investment: in particular, there are significant differences between market-oriented and export-oriented investment. Market-oriented FDI seems to be relatively little affected by considerations of taxation except, perhaps, where the host-country tax is unusually burdensome. By contrast, export-oriented FDI is far more sensitive to the host-country tax burden (Reuber, 1973; Mintz and Tsiopoulos, 1992). There is also evidence that the importance of taxation may vary according to the type of industry or activity concerned (Wilson, 1993). The differences seem to reflect the relative mobility of the investment and the range of possible locations.

Whereas most studies prior to 1990 concluded that taxation was an insignificant or at most a relatively minor factor in FDI decisions, the most recent studies have found a more marked relationship between taxation and FDI flows (Grubert and Mutti, 2000; OECD, 2002a). As barriers to FDI are eliminated, remaining obstacles assume an increased importance. Taxation becomes a factor in FDI decisions, other factors being equal: today, many of those other factors are more equal than they were even 10 years ago (Clark, 2000).

(b) Which taxes are important?

Just as some types of FDI are more influenced by tax considerations than are others, so some types of taxation are more likely than others to influence investment decisions. There is little or no evidence to suggest that the overall level of taxation in a country has much impact on either inward or outward FDI. If one examines those countries that are most successful in attracting FDI, in relation to their market size, some would be considered relatively low-tax countries, others high-tax countries, and still others in between. This seems to suggest that, to the extent that taxation is relevant, the tax "mix" is more important to investors than the overall level.

Not surprisingly, the CIT has received the greatest attention and has been the focus of most of the empirical studies, since it most directly affects the amount of profit that is available for distribution. The most successful countries (in attracting FDI) tend to have low to moderate rates of CIT, with reasonable provisions governing deductions, depreciation and loss relief (OECD, 2002a).

Although the CIT is widely recognized as the most important tax, from the point of view of prospective foreign investors, it is far from being the only tax consideration. The Ruding Committee (Ruding, 1992) found that withholding taxes on dividends, interest and royalties were also an important factor for a substantial proportion of investors. Among other taxes, individual income tax and social security contributions are normally a minor consideration, except to the extent that they have an unusually large impact on labour costs: however, such taxes may have a major impact on the employment of expatriate staff. Consumption taxes, such as the VAT, are largely irrelevant to FDI decisions, since they are passed on to consumers rather than borne by producing enterprises. By contrast, import taxes and customs duties are often important: high duties and taxes on the import of machinery and other capital goods increase the initial cost of investment and may constitute a disincentive to FDI.

(c) Investment incentives

According to conventional wisdom, tax incentives for foreign investment are not recommended (UNCTC, 1992; UNCTAD, 1996; Holland and Vann, 1998; OECD, 2002a). Tax incentives are bad in theory and bad in practice. They are bad in theory principally because they cause distortions: investment decisions are made that would not have been made without the inducement of special tax concessions. They are bad in practice because they are both ineffective and inefficient. They are ineffective in that tax considerations are only rarely a major determinant in FDI decisions; they are inefficient because their cost, in terms of tax revenue forgone, often far exceeds any benefits they may produce. They are also inequitable (since they benefit some investors but not others), are difficult to administer and are open to abuse.

The conventional wisdom is supported by much of the empirical evidence, the weight of which suggests that tax incentives are a decisive factor in probably no more than about 20 percent of FDI decisions, though that proportion undoubtedly varies widely from one country to another and from one type of investment to another. To the extent that tax considerations do play a part in investment decisions, it is commonly claimed that the general features of the host-country tax system are more important to potential investors than are special incentives (UNCTC, 1992: 49; OECD, 1995).[19] However, there is also substantial evidence that tax incentives are an important factor in some types of investment decisions.

Careful targeting of investment incentives can increase their effectiveness and reduce their inefficiency. The appropriateness (or otherwise) of targeting tax incentives to promote technology transfer is considered in section 4 of this chapter.

3. Tax obstacles to the importation of technology

All of the tax provisions reviewed already could be said to constitute obstacles to TOT in that they increase the cost of the transfer or reduce the rate of return. Most of those provisions are standard features of modern tax systems and are not major deterrents. Sometimes, however, taxes are imposed at unusually high rates, or in a way that is especially unfavourable to TOT. Countries wishing to promote the importation of technology may consequently want to review their tax laws to see whether there are provisions that present special obstacles and that could be removed or at least reduced. They might also consider whether any of the regular provisions can be modified in order to provide special incentives to promote TOT.[20]

Special obstacles might take any of the following forms:

- excessive import duties
- taxation of capital contributions
- restrictions on deductions
- high withholding taxes
- excessive taxation of expatriate employees

19 Margalioth suggests that developing countries can best attract FDI by offering zero or very low rates of CIT. Such a policy can, however, have a very high cost in terms of tax revenue forgone.

20 This question is discussed in section 5 of this chapter.

- absence of tax treaties

(a) Import duties

Import duties often serve a dual function – to raise revenue and to protect domestic products that compete with the imported product. Where TOT is an objective, the latter should normally not be a consideration, since there is usually no domestic alternative. If import duties are relatively high, as they often are in developing countries, consideration could be given to reducing them, or providing for exemptions, in the case of high-technology imports.

(b) Taxation of capital contributions

In most countries, the contribution of assets, tangible or intangible, to the capital of a company has few, if any, tax consequences. However, some countries treat it as a taxable event (IFA, 1997: 39). In India, for example, the sale of technology may be subject to a capital gains tax (sometimes at rates as high as 55 per cent) if the sale or receipt takes place in India. Similarly, in Spain, the sale of technology can give rise to a taxable gain if the transfer includes rights that are exercisable in Spain, though where the technology is exchanged for shares, there are rules allowing the gain to be deferred until the shares are disposed of.

A number of other countries impose restrictions on the contribution of assets to a company's capital. In Argentina, such a contribution is permitted but must be approved by a special agency established to monitor and register all technology transfer agreements,[21] and there are general restrictions on non-cash contributions to share companies. In Taiwan Province of China, patents and know-how may be contributed as equity capital, but subject to conditions, and may not exceed 20 per cent of the total equity contribution.

(c) Restrictions on deductions

The reason for restricting in-kind contributions of equity, especially of intangibles, seems to derive from the fear that such assets may be overvalued, thus allowing excessive profits to be extracted from the country. If so, the fear seems largely unjustified, since dividends can only be paid out of actual (after-tax) profits, so that the value placed on the company's capital is largely irrelevant.[22] A more realistic fear is that royalty payments for intellectual property or equipment rentals will be unreasonably inflated, since those payments are normally made out of pre-tax income.

One response is to restrict the amount that may be deducted in respect of such payments. In Brazil, for example, payments for technology must be approved by the relevant agency, and the maximum deduction for patent royalties may not exceed 5 per cent of the sales income from products manufactured under the patent. Somewhat similar restrictions apply to payments of technical assistance fees.

Arbitrary restrictions of this nature create distortions and are probably quite easy to circumvent. Their only justification would seem to be that they are a rather rough-and-ready

21 A similar rule applies in Brazil.

22 That is so, at any rate, in the case of contributions to a wholly owned subsidiary. In the case of contributions to a joint venture, the danger is that an overvaluation of assets contributed in kind will be to the detriment of the other (local) venture partner.

substitute for transfer pricing procedures that might be beyond the capacity of the host-country tax authorities to administer.

(d) Withholding taxes

High rates of withholding tax, especially on royalty payments, constitute an obvious deterrent to TOT. Latin American countries in particular tend to impose unusually high rates of withholding tax – 25 per cent in Brazil, 33 per cent in Argentina and as much as 42 per cent in Colombia. Other countries have statutory rates that are almost as high,[23] but those rates are usually reduced by tax treaties (often to 10 per cent or less).

Another problem is that withholding tax is normally levied on the gross amount of the payment. As a result, if the costs incurred in developing the technology are taken into account, the effective rate of tax can in some cases exceed 100 per cent of the actual profit. In countries where withholding rates are high, it may actually be advantageous (to the transferor) to be considered to be carrying on business in the host country, for in that case only the net profit is taxed.

Various arguments can be advanced in favour of high withholding taxes. First, it is claimed that royalty payments are often inflated and are used to extract excessive profits from the host country: high withholding taxes simply claw back some of those profits.[24] Second, the taxation of the gross amount of the payment is justified on the grounds that the transferred technology is usually not entirely new and that the costs of development will normally have already been written off in the exporting country (or will continue to be written off there). Third, it is claimed that the royalty payments will usually be taxed in the exporting country, with a credit allowed for host-country tax, so that high withholding taxes merely allocate the total tax revenue between the two countries, without acting as a deterrent to the TOT.

The above arguments are not entirely convincing. High withholding rates penalize not only those cases where excessive royalties are being charged but also those where the royalty is entirely reasonable. They are therefore a very inadequate substitute for proper transfer pricing procedures. High withholding taxes may well not be fully creditable in the exporting country, especially where the net taxable profit is substantially less than the amount of the gross payment. And in order to obtain the same net rate of return, the exporter (ECo) may well charge a higher royalty, to compensate for the excessive withholding tax, than it would if the withholding tax were levied at a more reasonable rate. The cost to the ICo would thus be increased, as would be the amount that the ICo would be able to deduct in computing its own taxable income. The effect would be that the tax collected from the ECo, as a result of a high withholding rate, would be at least partly offset by a reduction in the tax collected from the ICo.

(e) Taxation of expatriate employees

23 The Indian withholding tax rate on royalties is 30 per cent, as is that of the United States. France has a rate of 33 per cent.

24 In other words, it is an alternative to disallowing deductions, discussed in (c) above.

When expatriates do not become resident in the country to which they are sent, then they are taxed only on the portion of their income that has a source in that country. Usually that means only income derived from employment performed in the country. They may even escape tax on that income by virtue of a tax treaty: for example, if they are present in the country for less than 183 days and their salary is paid by their original employer, it is usually exempted from host-country tax by virtue of treaty provisions based on Article 15 of the OECD Model. However, if employees do become resident in the host country, whether temporarily or ordinarily, they will be potentially liable to personal income tax there on their worldwide income.

Where expatriates are subject to tax in the host country – whether as resident or as non-residents – this can give rise to a number of problems. Usually expatriates receive a remuneration package comprising elements such as the following:

- increased salary as a reward for taking on new responsibilities
- cost-of-living supplement
- various fringe benefits (accommodation, company car, removal expenses, school fees for children, home vacations, medical insurance, continued membership in pension plans and social security schemes)

The result may be a very heavy tax burden in the host country, owing to:

- taxation at a high marginal tax rate
- taxation of fringe benefits
- inability to deduct expenses
- liability to pay social security contributions

For example, in many developing countries, expatriate salaries are much larger than local salaries and are taxed at the top marginal rate of personal income tax. For example, in India, the top marginal rate of personal income tax applies to all income in excess of about $5,000[25] per year. Living costs are frequently very high for expatriates (owing, for example, to the lack of suitable housing), and if the usual fringe benefits are taxed, that will substantially increase the total tax burden. Again, social security contributions are quite substantial in some countries, even though expatriates rarely derive any benefit from those contributions. Usually they continue to contribute to home-country social security schemes and pension funds, and such contributions may not be deductible in the host country. All of the above add considerably to the cost of employing expatriates, and, though unlikely to actually deter TOT, may well lead to less effective methods of transfer. A number of countries provide various types of relief, which are discussed in section 4 below.

(f) Removing tax obstacles to technology importation

One of the most important effects of tax treaties, in the context of the present study, is that they usually reduce the rates of withholding tax on dividends, interest, and especially royalties and technical fees. Tax rates of 30 per cent or more are often reduced to 10 per cent or less. (In Denmark, for example, the “standard” rate of 30 per cent is reduced to an average of 8 per cent: in France, which has entered into tax treaties with more than 100 countries, the

25 All references in this study to "$" are to US dollars.

"standard" rate of 33.3 per cent is often reduced to 5 per cent or is not imposed at all.)[26] Other common features of tax treaties include the restricted definition of "permanent establishment", which may make it easier for technology to be transferred without the transferor being considered to be carrying on business in the importing country and being taxed accordingly.

Tax treaties have other advantages and are sometimes a significant factor in foreign investment decisions. Countries wishing to attract foreign investment, and TOT are consequently advised to attempt to negotiate treaties with the major technology-exporting countries.

However, it is important to understand that would-be technology-importing countries need not wait until they have negotiated a comprehensive network of tax treaties in order to remove impediments to technology transfer. There is nothing to prevent them, for example, from unilaterally adopting a reasonable definition of "permanent establishment", and reasonable rates of withholding tax on royalties.[27] Hong Kong (China), which because of its particular status in international law has (until very recently) been unable to enter into tax treaties, levies a withholding tax at a mere 1.65 percent on royalties paid to non-residents. Developing countries that seek to acquire technology would be advised to tailor their tax rules to complement the tax rules of exporting countries (Lee, 1999) and to adopt the standard, internationally recognized jurisdictional rules, definitions, and classifications that are applicable to income derived from TOT. The costs of doing so (in terms of tax revenue forgone) are likely to be negligible, and the benefits (in terms of increased investment and increased TOT) could be substantial.

4. Tax incentives to promote inward technology transfer

One of the most important questions facing policy makers, especially in developing countries, is whether they should rely entirely on an investor-friendly tax system, with reasonable tax rates and based on internationally accepted principles, to attract foreign investment and TOT or should in addition offer special tax incentives[28] aimed at particular types of investment or activity. As was previously noted, special incentives are generally not recommended and cannot be considered an adequate substitute for a satisfactory general tax system. Nevertheless, many critics of the use of tax incentives accept that there may be a case for them in order to promote activities such as R&D, if only as a way of countering market imperfections. One recent study of incentives identifies as a key policy issue the encouragement of development-oriented incentives on the part of both host and home countries (UNCTAD, 2004).

A recent OECD report puts the argument in favour of incentives for R&D thus: "Because private R&D rapidly becomes a public good, firms are prevented from recouping all the benefits of their investments. Asymmetric information and imperfect competition are other

26 In consequence, the "standard" rate is very much the rare exception rather than the rule.

27 The argument that high standard rates give a country a stronger negotiating position is not at all convincing (Easson, 2000).

28 The term "tax incentive" is used here in the sense of a statutorily favourable deviation from the general "benchmark" tax system. See Easson (2004), Chapter 1; Zee, Stotsky and Ley (2002), p.14.

market flaws that lead to gaps in R&D expenditures. Market incentives alone are insufficient to produce an adequate supply of R&D, making it crucial for governments to stimulate private R&D spending. As with any investment decision, R&D is not undertaken by firms unless there is an opportunity for profit. By changing the relative costs of research investments, through subsidies, taxes, trade or other policies, governments can influence the generation of research and knowledge for economic growth" (OECD, 2002b). Similar arguments might be advanced to support tax incentives for some other modes of TOT.

(a) Cost-effectiveness of tax incentives

A major objection to the use of tax incentives is that they are rarely cost-effective. Tax incentives have an obvious cost in the form of the amount of tax that would have been paid but for the existence of the incentive. They also have less direct costs in the form of administrative costs and of tax avoidance facilitated by their existence, and non-fiscal costs arising from the distortions that they create. Estimating those costs is extremely difficult, but available evidence indicates that they may be substantial. For example, a study of investment incentives granted in the United States and Western Europe between 1983 and 1995 found the cost (of the incentive) to vary from $13,000 to over $250,000 for each new job created, with the cost rising steadily over that period.[29]

The benefits produced by tax incentives are perhaps even more difficult to quantify. There may be a fiscal benefit, if the incentive attracts investment that would otherwise not have been made, and of the new investor pays some tax (i.e. is not granted a complete, indefinite exemption). However, the principal objectives of tax incentives are not fiscal: the main perceived benefits sought from investment incentives in general, and incentives for TOT in particular, include job creation, improved efficiency of domestic industries, increased foreign exchange earnings and export competitiveness. It is virtually impossible to place a monetary value on such benefits.

One thing does seem clear, however: the cost-effectiveness of tax incentives depends largely on the degree of *incremental* activity or investment that the incentives succeed in stimulating. To the extent that the activity or investment would have occurred in any event, the incentive represents a waste of government revenue.

Many studies have been made of the cost-effectiveness of tax incentives to promote R&D, though the studies have concentrated on the effects in developed countries, and it may well be that the effects would be different in less-developed countries.[30] According to the OECD report previously quoted,

"Fiscal incentives to business R&D can incur substantial costs to governments, raising concerns about their effectiveness in increasing private research efforts as well as opportunities for tax avoidance or evasion. Many studies show a correlation between R&D tax incentives and increases in private research spending within individual countries. Although it is difficult to relate heightened R&D intensity directly to fiscal measures, it appears that, on average, tax incentives can increase private research spending by an amount equal to the loss

29 UNCTAD, 1996: 29–30.

30 Again, one would expect wages and availability of skilled labour to be the most important factors.

in tax revenue. An examination of panel data on tax changes and R&D spending in nine OECD countries over a nineteen-year period (1979–97) found that a 10% decrease in the cost of R&D through tax incentives stimulated just over a 1% increase in the level of R&D in the short-run and just under a 10% rise in R&D in the long-run."[31]

The debate as to whether tax incentives can be a cost-effective instrument to promote investment, R&D and other forms of TOT will continue for years, with various studies reaching different conclusions. What can be predicted is that governments will continue to use tax incentives to pursue those objectives. It is also clear that the cost-effectiveness of tax incentives can be improved by careful targeting and design.

(b) Targeting tax incentives

If tax incentives are to be used, an initial issue that confronts policy makers is to decide *which* enterprises or activities should qualify. Countries, especially developing countries, attempt to promote the importation of technology by targeting tax incentives in a number of ways. In Asia, for example, China, Malaysia, Singapore and Viet Nam have an extensive range of tax incentives intended to promote TOT (Brown, 1990; Duyen, 2001; Kasipillai, 2003; Lee and Lan, 2002; Liu, 1998; Liu and Cheng, 2002; Ng, 2000; Tsoi and Pang, 1999; Wong and Gan, 2001).

Incentives are designed to:

- Attract investment in technologically advanced sectors
- Promote the importation of technologically advanced equipment
- Promote the employment of skilled technicians
- Promote job training of local workers
- Promote R&D
- Promote linkages.

In recent years it has been common to target incentives at technologically advanced sectors. Investment in electronics and other high-technology industries is widely seen as especially desirable for providing employment, boosting exports and modernizing the economy. According to one article, no fewer than 89 locations around the world now call themselves "Silicon" something – Silicon Bayou, Bog, Fen, Glen, Orchard and Prairie have been established as rivals to the original Silicon Valley (Miller, 2000). Almost all of them offer generous tax incentives to high-tech investors.

Competition has been especially strong in South and East Asia. Following are some examples:

- In 1999, the Government of the Philippines announced a 12-year tax holiday for projects that will produce raw materials for the electronics industry, the specific target being wafer fabrication projects
- In 2000, China, India, Singapore and Thailand announced new incentives for technology-intensive investments and projects especially for the electronics industry.

31 OECD (2002b), para. 33. A Canadian study found that each dollar of tax revenue forgone through tax incentives generated $1.38 in additional business research spending and concluded that incremental incentives are cost-effective in stimulating additional R&D (Canada, Department of Finance, 1998).

- In 2001, Malaysia and Thailand announced incentives for foreign investors in the silicon wafer fabricator industry. Similarly, China announced plans to establish a semiconductor industry with special tax holidays, and Viet Nam introduced new incentives for the software industry.
- In 2003, China introduced new tax incentives for the high-tech industry and the Republic of Korea announced 10 years of tax breaks to foreign investors in high-technology cultural industries. Further, Thailand announced new tax incentives for investment projects in information and communication technology industries.
- In 2004, the Government of Thailand instructed the Board of Investment to improve the investment incentives it extends to high-tech companies: tax exemption privileges for up to eight years were announced for hard disk drive makers.

An alternative approach that is sometimes adopted is to confer tax privileges on investments that meet one or more of a number of listed criteria. Several countries have developed the concept of "pioneer" industries. Qualifying industries receive preferential tax treatment, usually in the form of generous tax holidays. For example:

- In Singapore, pioneer status is granted to new manufacturing and service investments that introduce technology and/or skills substantially ahead of the average level prevailing in the local industry. Normally only projects involving products that are not already manufactured in Singapore will qualify.
- In Malaysia, the list of qualifying activities includes R&D and technical or vocational training. In the case of pioneer status, a 100 per cent exemption from profits tax is given for a five-year period.[32]
- In Mauritius, pioneer status is granted only to enterprises whose activities involve technology and skills above the average existing in Mauritius and which are likely to enhance technological development.
- In Nigeria, pioneer status may be conferred (*inter alia*) where the investment undertakes substantial employee training and is considered beneficial to the country's economy and the public interest.

Attempting to promote TOT by favouring high-tech industries has its limitations, since many conventional industries use advanced technologies whose introduction could be equally (or perhaps more) beneficial to the host country. Incentives are frequently given for the acquisition of technologically advanced equipment, both by foreign investors and by domestic firms. For example:

- China offers an enterprise using advanced technology and equipment an additional tax holiday of three years, at half the normal CIT rate, after the expiry of any other tax holiday for the enterprise it is eligible. The enterprise must introduce newly developed products and must have a TOT agreement in its joint venture contract, and the imported machinery and equipment must be superior to Chinese-produced machinery in terms of performance and efficiency. Further, the importation (by domestic and foreign-invested enterprises) of equipment may be exempted from customs duty and VAT if it is for use in one of the projects listed in the "encouraged category." A recent reform also exempted software and integrated circuit companies

32 Most pioneer companies receive only a 70 per cent exemption.

from customs duty and import VAT for all "self-use" equipment and accompanying technology (including software), parts and accessories.

- Romania offers all investors exemptions from customs duty on the importation of technology and equipment used for new investment.
- In Serbia, accelerated depreciation (at 25 per cent above the normal rate) may be claimed for investment in computers or in assets used in environmental protection or energy conservation, for science, research and personnel training, and for a number of other purposes.
- In Taiwan Province of China, new rules introduced in 2003 allow companies in "scientific industries" an exemption from customs duty and business tax on their imported equipment, if such equipment is not available in the domestic market.

This type of approach requires an actual transfer of technologically advanced equipment, rather than simply favouring high-tech industries (some of which often assemble imported components using cheap labour). Nevertheless, it is not without drawbacks. In the case of foreign investment, the equipment remains the property of the investor and is often retained under the control of foreign technicians, so that there is no real transfer of *technology*. Tax concessions of this nature may also be an invitation for the "gold-plating" of investments, leading to the use of unnecessarily expensive equipment and to the less efficient choice of machinery (Holland and Vann, 1998). They may also require a determination of whether the equipment in question really is "advanced" – something that tax authorities are rarely qualified to judge.

As was noted in Section 3 above, the application of normal tax principles to expatriate managers and technical staff can often impose a cost and may deter the employment of those individuals who are best able to impart their expertise to local staff. It is consequently not uncommon for countries – both developed and developing – to adopt special rules giving preferential tax treatment to such persons. For example:

- The Republic of Korea recently introduced a package of tax incentives designed to attract investment by high-tech business, including exemption from personal income tax for foreign engineers.
- Mauritius offers incentives to attract foreign and domestic investors to the information and communication technology sector. The incentives include a 50 per cent income tax reduction for expatriate employees, duty-free status for their personal effects coming to Mauritius, accelerated procedures for visas and work permits, and the availability of work permits for spouses.
- Singapore permits a double deduction in respect of fees paid and other benefits granted to approved consultants engaged to research and develop new financial products and activities. Double deduction is also allowed for qualifying expenses incurred in relocating or recruiting employees from outside Singapore.
- In Thailand, expatriate employees are allowed to pay personal income tax at a flat 15 per cent rate for two years instead of at the usual progressive rates (which rise to 37 per cent).
- Viet Nam taxes foreign "experts" working in the country under a rate schedule different from the one that applies to domestic workers, with a higher income tax threshold and a lower maximum rate.

Among developed countries, the Netherlands and Sweden have recently introduced new tax concessions for expatriate employees. The Swedish provisions, for example, apply to "experts, researchers or other key employees when working temporarily in Sweden" and allow a 25 per cent deduction from salary (to compensate for increased living expenses) and a 25 per cent reduction in social security charges.

One reason for encouraging the importation of foreign experts is the expectation that they will pass on their skills to local employees. A more proactive approach is to provide incentives to firms – especially foreign investors – that provide training for their local staff. That is done in a number of sectors (often in conjunction with R&D incentives) in several countries. For example, the Philippines, Puerto Rico and Singapore all allow the double deduction of training expenses, and Taiwan Province of China grants a tax credit, to be set against profits tax, for such expenditures.

Another way of transferring technical knowledge and skills to local personnel is to send them abroad to study. Malaysia allows its firms (whether domestically or foreign owned) to claim a double deduction for expenditure on R&D activities undertaken abroad, *including* the training of Malaysian staff.

Incentives for carrying out R&D activities are common in both technology-importing and technology-exporting countries (and are considered further in Chapter III of this study). Among developing countries,

- China grants a R&D "super deduction" (of 150 per cent) for incremental R&D expenditure. A variety of other tax privileges are granted to specially established R&D centres.
- India allows a "super deduction" (of 125 per cent) of certain scientific research expenses and for R&D-related capital expenditures.
- Malaysia grants a five-year tax holiday for approved research companies or institutions, and a double deduction of research expenditure may be claimed in some circumstances.
- Mexico allows a tax credit of 30 per cent on total R&D expenses and on investments in R&D of technology.
- Nigeria grants a 20 per cent additional investment allowance for qualifying capital expenditure for companies engaged in R&D activities.
- As an alternative to "pioneer" privileges, Singapore grants an investment allowance (an additional deduction over and above the normal capital allowance claimable) of up to 100 per cent of the fixed capital expenditure incurred for R&D projects. A double deduction may be claimed for current R&D expenses.
- Turkey allows R&D expenses to be deductible at 1.4 times the original expense amount.

As was already noted, tax incentives for R&D are widely used in developed as well as developing countries. As the OECD report on tax incentives for research and development emphasizes, "Clarity, consistency and predictability are essential to assist enterprises in making R&D investment decisions partly on the basis of tax incentives…. Permanence in R&D tax relief allows corporate planning over the longer-term; evaluations show that R&D tax incentives are more effective when provided over a longer period. Overly complex

schemes – or those which change frequently – will act as a deterrent to R&D investments" (2002b).

A difficult issue is whether tax incentives should be based on the total volume of R&D expenditure or granted only for incremental expenditure (i.e. the increase over the previous year's level). Volume-based schemes tend to be simpler for both companies and governments, though they also tend to be more expensive.[33] A further concern related to R&D tax incentives is the possibility for tax evasion or avoidance by companies – for example, when a tax credit or other privilege is claimed for non-R&D spending.[34]

It is generally easier for a country to facilitate and promote the importation of technology than it is to secure the *transfer* of technology. The local subsidiary of a foreign company may import sophisticated machinery and use advanced patents and processes, yet little or none of this technology may be transferred in any meaningful way to the inhabitants of the host country. Genuine TOT is likely to take place only if linkages are established between the foreign investor and domestic firms.[35]

Some countries have attempted to promote such linkages by means of tax incentives, usually by making tax privileges conditional on the use of local labour or materials. However, such provisions, by giving preference to the use of local raw materials or components, act as a form of barrier to imports and might well be held to be contrary to the GATT/WTO rules. In particular, the TRIMs Agreement prohibits a variety of measures aimed at restricting imports or promoting domestic production. The illustrative list includes measures that impose domestic content or trade-balancing requirements. Thus a Brazilian proposal to make tax incentives to automobile manufacturers conditional on the use of a specified minimum of local content (and on exporting part of their production) was debated at the WTO.

(c) Choosing the appropriate incentive

Formulating an incentives policy involves two basic decisions – which enterprises or activities should receive tax advantages (targeting), and what form those tax advantages should take (design). Tax incentives, as the term implies, operate through the tax system and confer benefits in the form of reductions in the tax that would otherwise be payable. Following are the most commonly employed forms of incentive:

- reduced rates of corporate income tax for particular activities or types of enterprise
- tax holidays (reduction of or exemption from tax for a limited duration)
- investment credits or allowances for investment in capital assets
- accelerated depreciation of capital assets

33 The OECD report (para. 41) suggests that they are likely to give windfall profits to companies that would have conducted R&D in any event. However, that can also be the case with incentives targeted to incremental expenditure. Both approaches can cause enterprises to distort their behaviour in order to maximize access to tax credits.

34 There is a substantial literature on the Canadian experience with R&D incentives and the types of problems and abuses that these can give rise to: see Gunz, Macnaughton and Wensley (1995).

35 On the creation of such linkages generally, see UNCTAD (2001).

- deduction rules that permit an amount greater than actual cost to be claimed
- deductions or credits for reinvested profits
- reduced rates of withholding tax on remittances to the home country
- reduced personal income tax and/or social security contributions for executives and employees
- exemption from, or reduction of, VAT or other forms of sales taxation
- property tax reductions
- reduced import taxes and duties.

Most of these forms of incentive can be, and are, used to promote TOT, though some are clearly more suitable than others. Although much has been written on the subject of investment incentives, relatively little attention has been paid to the question of how to match the particular type of incentive to the chosen objective or target, and the widespread use of tax holidays suggests that sufficient thought is rarely given to the actual design of investment incentives.

Those who advise on investment incentive policies generally regard tax holidays as the least meritorious of all forms of incentive (Bergsman, 1999; Tanzi and Zee, 2000). Tax holidays may be reasonably effective in attracting mobile, quick-profit investment, but otherwise are an extremely crude instrument and are ill suited to achievement of most of the objectives for which they are granted. In particular, tax holidays to promote TOT make little sense, although they are often employed with that objective.

As was suggested above, granting tax holidays to investors in the high-tech sectors does not necessarily result in any significant degree of TOT. Tax holidays for firms that utilize technologically advanced equipment may induce the investor to adopt inappropriate technology in order to secure tax privileges, and the rewards (in terms of tax spared) may be out of all proportion to the cost of the technology introduced. In addition, tax holidays are notoriously prone to manipulation and provide opportunities for tax avoidance and abuse (McLure, 1999).

More appropriate would be an exemption from customs duty on importation of technologically advanced equipment, or an investment allowance based on the actual value of such equipment. Similarly, enhanced deductions for current expenditures, such as software purchases, training costs, and R&D expenditures, have the advantage of being related to actual expenditure and linked to performance.

Another suitable form of incentive might be the imposition of reduced or zero rates of non-resident withholding tax on technology-related payments. For example:

- In China, withholding tax is frequently waived or reduced on royalties received by a non-resident enterprise: royalties paid in respect of the use of advanced technology are exempt, and reduced rates apply to royalties derived from scientific research.
- Malaysia grants exemption from withholding tax for “approved royalties” that are certified as payable for the purpose of promoting industrial development.
- In Singapore, exemption from withholding tax may be granted in the case of royalty payments to non-residents made for any purpose that will promote or enhance economic or technological development.

An objection to this form of incentive, however, is that it may well be nullified by a corresponding increase of tax in the home country, unless a tax-sparing credit[36] is available.

A relatively recent phenomenon has been the establishment of special "parks" or "zones" reserved for high-tech investment, and usually enjoying substantial tax benefits in addition to various other inducements of a non-fiscal nature. The objective is to provide an attractive location for technological activities by both domestic and foreign-invested firms and, by concentrating such activities in a single location, to utilize scarce resources to the best advantage and stimulate spin-offs. Frequently, the "park" is located close to, or actually contains, a university or other research establishment.

In general, technology-importing countries could design their tax rules to facilitate the acquisition of desired technologies into target sectors. For example, reduction or elimination of import duties and withholding taxes for technology products or services, especially those required to perform R&D activities or technology upgrading in line with their development strategies, may facilitate TOT. Similarly, careful targeting of incentives could promote FDI inflows as well as TOT to the desired industrial sectors.

36 Discussed in Chapter III.3(c) below.

Chapter III
Tax policy considerations involved in technology exports

1. General considerations

From a tax perspective, the objectives of technology-exporting countries are in many ways similar to those of technology-importing countries. They encourage their enterprises to develop new technologies and to exploit and to export the technology that they have developed, thereby increasing their ability to earn income. At the same time, they wish to derive tax revenue from what they consider to be a fair proportion of the profits resulting from the export. These two objectives can come into conflict, and tax rules that are designed to protect the domestic tax base can create disincentives to transfer technology abroad.

2. Tax implications for technology transfer

As is the case in technology-importing countries, a number of the exporting countries' tax provisions may have implications for TOT. Of particular importance are immediate tax liability occasioned by the transfer, transfer pricing rules, disallowance of expenditures incurred in creating the technology, and failure to allow tax-sparing credits.

As was noted in Chapter I, often no tax cost is occasioned in the exporting country by the actual TOT. However, where the transfer involves the disposal of a capital asset (tangible or intangible), it may give rise to a taxable capital gain, or, if the asset is a depreciable asset, there may be a recapture of depreciation. If the asset is sold to an unrelated party, any resulting tax liability will probably not be perceived as constituting an undue obstacle to the transfer. However, if the asset is contributed to a subsidiary or joint venture as part of its charter capital (in return for shares), there may be a tax liability (without there being actual proceeds of disposal out of which to pay the tax) that could substantially increase the cost of the transfer.

In some cases, where a company transfers technology property to a foreign company otherwise than by sale or license (e.g. in return for shares), it must include in its annual income an "imputed royalty", based on the amount of income it would have received if the property had been licensed in an arm's-length transaction.[37] Moreover, that imputed royalty is treated as home-country income, with the result that no credit can be given against it for foreign taxes (Rogers and Wunsch, 1997). In practice, various complex structures (often involving the creation of a foreign partnership) are often devised to avoid the tax (Parnes, 1993; Raedel and French, 1996).

Transfer pricing rules, of varying complexity, exist in most countries and are obviously necessary to protect a country's tax base. Such rules are often difficult to apply when there are no readily available comparables, which is often the case with technology property (because of its relative uniqueness), and especially so with intellectual property. Paradoxically, although they constitute an obstacle to TOT, the very complexity of the rules

37 The rule appears to be unique to the United States.

can have the unintended result of encouraging companies to move their intangible assets offshore (Lev, 2002).[38]

The rules on deduction of expenses may also constitute an obstacle to TOT. The problem can be illustrated by contrasting the Canadian and US approaches to the deduction of R&D expenses. Both countries allow the deduction, in computing taxable income, for expenditures incurred by their firms in conducting R&D, and both provide a variety of tax incentives for R&D activities carried on in their respective countries. Some of the technology that is developed may be exported to other countries and earn income there, which may, for reasons explained already, not be taxed in the exporting country. In Canada, that fact is considered unimportant. A Canadian company is able to develop technology in Canada and transfer it to an offshore subsidiary, which can then licence it to the eventual importers: the costs incurred in developing the technology remain fully deductible, even though the income derived from it may escape tax in Canada (Bernstein and Guilbault, 1997).

By contrast, the United States takes the position that expenditures should be deductible only to the extent that they produce income taxable in the United States. Thus, R&D costs must be apportioned and allocated between domestic-source income and foreign-source income: only that proportion of the R&D expenses that is attributable to US-source income is deductible. If the foreign jurisdiction taxes the income derived from the technology on a gross basis – for example, by treating it as a royalty and levying a withholding tax – or taxes it as business income without permitting the deduction of the expenses originally incurred in the United States, the result may be double taxation.

3. Incentives for technology transfer

Incentives to promote outward TOT are comparatively rare. However, there are various general tax incentives that are especially relevant to TOT.

(a) R&D incentives

A number of technology-importing countries provide special tax incentives to promote R&D activities. One motive is to encourage domestic firms to develop new technologies; another is to encourage TNCs to locate their R&D activities within the country, thereby providing employment, training local staff and producing other spillover benefits. Similar motives are apparent in technology-exporting countries: domestic firms are encouraged to become, or remain, more competitive by upgrading their technology, and are also encouraged to provide employment (Lenjosek and Mansour, 1999).

Special R&D incentives, which are comprehensively reviewed elsewhere (OECD, 2002b), usually take one of three forms:

- *tax deferrals* in the form of a delay in payment of a tax (e.g. special depreciation allowances and current deduction of long-term expenditures)
- *tax allowances* permitting the deduction of amounts additional to actual expenditures

38 The initial transfer to a foreign affiliate will be subject to transfer pricing review, but subsequent licensing of the technology by the affiliate can be undertaken without the further inconvenience of review by the home-country authorities. (The affiliate would obviously be located in a country with less stringent transfer pricing procedures.)

- *tax credits*, which are amounts deducted from tax liability

Many countries use income tax incentives to encourage R&D undertaken *within national boundaries* for business purposes (Canada, Department of Finance, 1998). Japan appears to be one of the few exceptions in extending its incentives to activities carried on in other countries.

The provision of R&D incentives to promote technology creation indirectly facilitates TOT to developing countries. However, growing political concern about outsourcing, including the perceived growing tendency by TNCs to conduct some of their R&D in developing countries where labour costs (and taxes) are substantially lower, may increase pressure on governments to grant more generous tax incentives in order to keep R&D activities, and jobs, at home (Billings and Pashke, 2004; Rashkin, 2003).

(b) Export incentives

Tax incentives to promote exports of technology are relatively rare among developed countries, in part because such incentives in the manufacturing sector could, in some circumstances, fall foul of the WTO Subsidies Code.[39] In one sense, the exemption from tax of foreign-source business income or the granting of tax-sparing credits could be considered a form of incentive to transfer technology:[40] certainly, they increase the advantage of investing in, or doing business in, countries where the tax payable is less than it would be at home.

A few countries do provide tax incentives specifically directed at the export of technology. For example:

- India permits the deduction (from taxable income) of 50 per cent of royalty and service fee income earned abroad from the use of patents or inventions, and of 100 per cent of profits from the export of computer software or the provision of technical services related to software.
- Japan allows a special deduction of the income derived from the export of certain technology or the provision of technical services outside Japan, in particular where a Japanese company exports technology-related rights to "newly developed areas" for the purpose of its manufacture, or provides technical services in such areas; the eligible areas are mostly developing countries.
- Korea grants an exemption for 50 per cent of the income derived from the transfer or licensing of technology.
- Sri Lanka provides an exemption for income earned from the export of technology by means of the provision of professional services, provided a reasonable amount of that income is repatriated to Sri Lanka; various other tax holidays and exemptions are given to exporters.

39 The US report (Rogers and Wunsch, 1997) on taxation of income derived from the supply of technology observed that in some cases technology exports could take advantage of the foreign sales corporation (FSC) provisions. Those provisions have subsequently been ruled by a WTO panel to be prohibited.

40 Without being within the WTO definition of a "subsidy".

(c) Tax sparing

As was already noted, countries – especially developing countries – frequently provide tax incentives to promote inward FDI generally, and inward TOT in particular. Where the exporting country adopts the tax credit method to provide relief from double taxation, it is evident that a reduction in the amount of tax payable in the source country can simply result in a reduction in the amount of credit that may be claimed in the residence country, with a corresponding increase in the amount of home-country tax payable. There would consequently seem to be little point in potential host countries' seeking to attract investment by offering tax incentives or generally low tax rates, since the benefit of the tax forgone, or "spared", would accrue not to the investor (ECo) but to the investor's home country.

One response to this problem is the "tax-sparing" credit. Developed countries (with the exception of the United States) that apply the credit method of avoiding double taxation commonly include such a provision in their tax treaties with developing countries, though in recent years tax sparing has become rather less popular, and several OECD member countries have become more restrictive in granting it in their treaties (Owens and Fensby, 1998; Thuronyi, 2003). The effect of a tax-sparing provision is to allow a home-country credit for the host-country tax that is deemed to have been "spared" as a result of specific incentive measures granted to investors. The credit usually applies to reductions in business profits tax, and often also to reductions in withholding taxes on dividends, interest or royalties granted under specific incentive legislation.

In practice, the importance of tax sparing may be exaggerated, since only in a relatively few circumstances do host-country tax reductions actually result in an increase in home-country tax liability (Margalioth, 2003: OECD, 2003: 87). That is so because:

- Some countries employ the exemption method to relieve double taxation, especially for income from active business (i.e. there is no home-country tax liability anyway).
- Where an investor operates in the host country through a subsidiary rather than a branch, home-country tax is normally deferred (if it is imposed at all) until such time as income is repatriated to the parent company, and that is often avoided by the interposition of a third-country intermediary.
- Even where the profits are repatriated and become liable to home-country tax, the parent company may be able to take advantage of excess foreign tax credits (from other investments in high-tax countries) to reduce or eliminate any liability.

In sum, with good tax planning, it would not to be too difficult to avoid having the benefit of low host-country taxation neutralized by the home country. Nevertheless, the existence of tax-sparing credits can be advantageous in the sense that it permits the ECo to employ a broader range of structures for transferring technology. In particular, it is often difficult to avoid home-country taxation of royalties and fees for services, since those will be included in the ECo's taxable income in its home country when they fall due, and (as was noted previously) CFC rules usually prevent the accumulation of such income in a tax haven or preferential tax regime. Tax-sparing credits, in respect of reduced rates of (or exemption from) withholding tax in the host country, could thus facilitate some forms of TOT.[41]

41 However, not all tax sparing provisions apply to reduced withholding taxes, and when they do, they often limit the extent of the relief.

4. Tax policy measures to promote technology transfer

As a recent UNCTAD study points out, home-country incentives for investment in, and TOT to, developing countries are usually of a hortatory nature only.[42] A number of writers have considered whether developed-country tax systems might do more to facilitate and encourage *investment* in developing countries. Encouraging FDI would also promote TOT. Various modifications to existing rules and practices have been proposed or considered, including the adoption of tax-sparing credits (Laurey, 2000), the granting of a deemed credit in the amount of tax that would have been paid to the foreign country had it not provided a tax subsidy (McDaniel, 2003), or (more radically) the exemption from tax for business income earned in developing countries, and in particular in sub-Saharan Africa (Brown, 2002).

Specifically, in order to facilitate TOT especially to developing countries, technology-exporting countries might consider allowing the deferral of capital gains taxation, or of the recapture of depreciation, where technological property is contributed to the capital of a foreign subsidiary. Thus, where the property is contributed to a subsidiary or joint venture as part of its charter capital (in return for shares), tax liability could be postponed by allowing a rollover, with the cost base of the transferred assets becoming the cost base of the shares, and with any tax liability deferred until the disposal of the shares. That is often done where the transfer is between companies that are both resident in the same country. However, it is rarely permitted in international transactions, largely because of the difficulty of monitoring subsequent transactions and because of the risk of abuse. For example, the asset might be promptly sold by the subsidiary to an unrelated party, so that in effect the subsidiary was used as a conduit for conducting an arm's-length sale while deferring tax liability indefinitely. The possibility of such abuses might well undermine the integrity of the entire capital gains and depreciation systems of the exporting country. It would also seem impractical to restrict rollover relief to those cases where the technology was transferred to developing countries.

In any event, although the imposition of immediate tax liability where such a transfer occurs does constitute an obstacle to TOT, it seems unlikely that it would actually deter a transfer otherwise considered advantageous. Consequently, the costs of such a measure, in terms of the risk of abuse, would probably outweigh any potential benefit.

Another possible measure would be to extend R&D incentives to include activities performed in other countries (and especially in developing countries), rather than restricting them to activities carried out in the home country, as is usually the case. One objection to that course is that R&D incentives tend to be difficult to monitor and would become much more so if the activities were carried on abroad. There is also a strong likelihood that a firm would receive two sets of tax incentives – from the home country and from the country in which the activities were carried out.[43]

42 UNCTAD, 2004:43. The only comprehensive international agreement addressing the issue of home-country incentives is the 2000 Partnership Agreement between the European Community and the members of the ACP countries (UNCTAD, 2004: 44).

43 Ireland, which grants tax incentives for R&D performed in other member countries of the European Union and the European Economic Area, has special provisions to prevent "double-dipping" (McLoughlin, 2004).

As was noted previously, one objective in granting R&D incentives is to encourage one's own firms to be innovative and thus enhance their competitiveness; in that case, it should not matter whether the R&D is conducted at home or abroad.[44] However, an equally important objective in many countries is to promote research activities within the country, in order to provide skilled employment and to boost the *country's* technical capacity. To grant incentives for R&D activities performed abroad would run directly contrary to that objective. It also seems doubtful whether extending the scope of R&D incentives would have any significant impact on the location of R&D activities: when firms outsource their R&D activities it is usually because of lower costs (especially labour costs) in the chosen location rather than for tax reasons.

A third possible measure to encourage TOT to developing countries would be to grant tax-sparing credits in respect of reduced rates of withholding tax on royalties and professional fees (where this is not already done). Although the recent tendency in developed countries has been to limit the scope and availability of tax-sparing credits, there seems to be relatively little risk of their being abused, and appropriate countermeasures are available to prevent abuse.[45] The cost to the home country of such credits is likely to be very small, and the availability of a credit might even have the effect of encouraging the repatriation of royalties and fees, rather than their being accumulated offshore in a tax haven. Nevertheless, as with the other suggested measures, the impact of improved tax-sparing credits on the level of TOT to developing countries is unlikely to be significant.

In sum, there are tax policy options that technology-exporting countries could provide to facilitate TOT to developing countries. However, the most effective approach would be to tailor tax policy to facilitating FDI in developing countries generally, in the expectation that increased TOT will be one of the benefits flowing from such investment.

44 This appears to be the position taken by Singapore.

45 E.g. limitation-of-benefits provisions.

Concluding remarks

Technology transfer is seen as one of the key elements needed to enable developing countries to integrate and compete in the global economy as well as to meet their development aspirations. Tax policies in the technology-importing (host) country as well as in the technology-exporting (home) country have implications for the form and mode in which TOT takes place.

The vast array of tax instruments available to technology-importing and technology-exporting countries may facilitate or hinder TOT. The formulation of a tax policy with respect to the importation of technology involves the balancing of conflicting objectives. On the one hand, countries wish to facilitate the acquisition of technology: on the other, they wish to derive, in the form of tax revenue, a fair share of the profits that accrue to the foreign owner of that technology by virtue of the transfer.

From a tax perspective, the objectives of technology-exporting countries are in many ways similar to those of technology-importing countries. They encourage their enterprises to develop new technologies and to exploit and to export the technology that they have developed, thereby increasing their ability to earn income. At the same time, they wish to derive tax revenue from what they consider to be a fair proportion of the profits resulting from the export. These two objectives can come into conflict, and tax rules that are designed to protect the domestic tax base can create disincentives to transfer technology abroad.

In general, all tax provisions could be perceived as obstacles to TOT, in that they increase the cost of the transfer or reduce the rate of return. However, most of those provisions are standard features of modern tax systems and do not constitute major deterrents. Sometimes, however, the taxes are imposed at unusually high rates, or in a way that is especially unfavourable to TOT. Special obstacles might take the form of excessive import duties or taxation of capital contributions or restrictions on deductions or high withholding taxes or excessive taxation of expatriate employees or the absence of tax treaties.

Formulating an incentives policy to promote TOT involves two basic decisions: which enterprises or activities should receive tax advantages (targeting), and what form those tax advantages should take (design).

A number of recent debates have considered whether developed-country tax systems might do more to facilitate and encourage investment in developing countries. (Encouraging FDI would also promote TOT.) Various modifications to existing rules and practices have been proposed or considered, including the adoption of tax-sparing credits (Laurey, 2000), the granting of a deemed credit in the amount of tax that would have been paid to the foreign country had it not provided a tax subsidy (McDaniel, 2003), or the exemption from tax for business income earned in developing countries, and in particular in sub-Saharan Africa (Brown, 2002).

Another possible measure would be to extend R&D incentives to include activities performed in other countries (and especially in developing countries), as in the case of Ireland, rather than restricting them to activities carried out in the home country, as is usually the case.

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ANNEX
UNCTAD's work in the area of technology transfer and intellectual property rights
(www.unctad.org/tot-ip)

Responding to mandates received from member States at UNCTAD XI in São Paolo and from the Bangkok Plan of Action, the UNCTAD secretariat is implementing a transfer of technology and intellectual property rights (TOT-IP) work plan under its international arrangements programme (covering issues related to investment as well as technology and IP). The TOT-IP initiative seeks to help developing countries participate effectively in international discussions on TOT and IP, and to identify policy options for successfully integrating developing countries into the world economy. The programme conducts research and policy analysis, technical assistance and policy dialogues with negotiators, diplomats and policy makers.

A. Work in the area of technology transfer

The TOT study series addresses government officials, international organizations and agencies, and researchers. It draws lessons from successful experiences with technology transfer and diffusion in developing countries and the effectiveness of the different modes of TOT.

- ***Case studies on TOT in developing countries.*** UNCTAD's series *Transfer of Technology for Successful Integration into the Global Economy* consists of a number of case studies on TOT issues in individual industries in selected developing countries. The series includes studies on the aircraft, automotive, automobile components, electronics, pharmaceutical and salmon fish industries in selected developing countries. These studies draw lessons from successful experiences with the transfer and diffusion of technology through various channels.

- ***Home-country measures in promoting TOT.*** The paper presents an overview of initiatives and measures as well as incentives provided to industry and public institutions in developed countries to facilitate TOT to developing countries. It covers measures that promote TOT through investment, training, matchmaking services, financing and development of the technological absorptive capacity of developing countries.

- ***Compendium of international TOT arrangements.*** To provide an overview of existing technology-related provisions in international instruments, UNCTAD has compiled a *Compendium of International Arrangements on Transfer of Technology: Selected Instruments*. This compendium contains a selection of TOT-related provisions drawn from international instruments. It includes relevant excerpts from international instruments at the multilateral, regional, interregional and bilateral levels. The technology-related provisions in such instruments follow different approaches, depending on the purpose of the instrument. They all aim at promoting access to technologies. In some cases they also seek to foster the development of local capabilities in developing countries, particularly least developed countries.
- ***Providing substantive input to the Working Group on Trade and Transfer of Technology***. At the request of members, UNCTAD has been providing substantive

input to the WTO Working Group and the Like-Minded Group through presentation of its studies on TOT.

B. Work in the area of intellectual property rights

The UNCTAD-ICTSD46 Project on Intellectual Property Rights and Sustainable Development addresses the concerns voiced by developing countries with respect to implementation of the TRIPS Agreement and new developments brought about in the area of IPRs by multilateral treaties and regional and bilateral free trade agreements.

The project aims to improve understanding of the development implications of IPRs and facilitate informed participation in ongoing multilateral, regional and bilateral negotiations, as well as assisting national authorities in the implementation and adoption of forward-looking IPRs policies.

The project consists of three interrelated components:

1. Policy-oriented interdisciplinary research. Highlights of the project's research outputs include:

- A *Resource Book on TRIPS and Development* providing a development-oriented analysis of each provision of the TRIPS Agreement, taking into account economic and social implications and IPRs trends in non-WTO forums. The entire book is available on the project website and was published in a revised version by Cambridge University Press in 2004.

- Series on various topical IPRs issues, including studies on TOT, public health, geographical indications, nutrition, traditional knowledge, TRIPS-plus in bilateral and regional agreements, technical assistance, innovation, competition and computer software.

- *A Policy Discussion Paper: Intellectual Property Rights: Implications for Development*, a synthesis of the main issues to help policy makers, stakeholders and the public in developing and developed countries understand the development impact of IPRs and different policy positions regarding TRIPS.

2. Enhancing policy formulation. The project places considerable emphasis on helping developing countries enhance IP policy formulation by establishing and supporting networks. The overall objective is to facilitate the emergence of a critical mass of well-informed stakeholders that could play an active role in future policy making.

- *At the international levels*, the project has convened a series of dialogues involving key policy makers and stakeholders at the Rockefeller Foundation facilities in Bellagio, Italy, in order to build and promote a development-oriented agenda on IPRs.

- *At the regional and national levels*, the project works closely with selected centres of excellence based in established universities and research institutions in developing

46 International Centre for Trade and Sustainable Development.

countries, as well as with NGOs, the media and parliamentarians. The main means of collaboration are joint research and regional dialogues, which draw *inter alia* on the existing and ongoing research described above.

3. Outreach and dissemination. Outreach and dissemination are carried out both through traditional channels and, in particular, through continuous updating and maintenance of the project website. Regular informal encounters with stakeholders in Geneva are organized to continue raising awareness and to keep Geneva-based delegations informed of the project's activities, including the regional dialogues.

Since 2001, the project has benefited from the financial support of the Department for International Development (United Kingdom), the Swedish International Development Cooperation Agency and the Rockefeller Foundation.