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Tax-Aided Financial Services Companies and the Cost of Capital

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Abstract

Over the past two decades, the governments of several European countries have implemented special tax devices to attract the finance centres of multinational companies. This paper determines how the cost of capital for investments made by multinationals is affected by the tax regimes, bringing into play the Irish financial services company, the Belgian co-ordination centre, the Dutch finance company and the Luxemburg company coupled with a Swiss finance branch. It gives evidence that intermediation of a tax-aided services company in the financing scheme of a foreign subsidiary provides an important tax saving. However, the home and source countries' tax regimes influence the hierarchy of the less heavily taxed treasury and finance centres. The methodology relies on the marginal effective tax rates theory and consists of an extension of Alworth's (1988) model to include treasury centres.

JEL classification: F23, G32, H25, H73.

I. INTRODUCTION

It is generally admitted that multinational companies can take advantage of international tax planning. A possible way is to use tax-aided financial services companies. Over the past two decades, indeed, the governments of several European countries have implemented special tax devices to attract internationally mobile capital. In particular, substantial tax advantages have been provided in Belgium, Ireland, the Netherlands and the Grand Duchy of Luxemburg to foster the setting-up of treasury and finance companies related to

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multinational groups. More precisely, the following statuses compete with each other: the Belgian co-ordination centre, the Irish financial services company and the Dutch finance company. A head office located in Luxemburg with a Swiss finance branch is another structure giving rise to a reduced effective tax burden.

The subject is particularly topical today. It refers to the problem of tax competition between European countries. Recently, the European Council's code of conduct aimed at combating unfair tax competition and fiscal degradation recommended dismantling the exceptional tax advantages granted to treasury and finance centres by 2002.

For a multinational company, where should the financial services department be located or, in other words, what is the best choice among these exceptional tax regimes? Which of them provides the lowest financing cost — or, symmetrically, the largest tax saving? Do the home and source countries' tax regimes affect the magnitude of the advantages and the hierarchy of different statuses? The economic literature about marginal effective tax rates on income from capital provides useful tools for dealing with these questions. The basic concept is the (user) capital cost. It expresses the minimum rate of return the investment project must yield before taxes in order to provide the finance supplier with the required net-of-tax return. In the neo-classical tradition, the cost of capital is measured for the marginal unit of capital, i.e. the last one to be profitable. First derived by Jorgenson (1963) and Hall and Jorgenson (1967), it has become a key element in King and Fullerton's (1984) model aimed at measuring the distortion caused by taxes for a domestic investment. Alworth (1988) generalised the approach by accounting for cross-border investments. From then on, numerous applications[1] and extensions[2] have been performed in the literature.

The purpose of this paper is therefore to measure how the capital cost of a multinational is affected by tax-aided financial services companies and compare — only from the point of view of the firm — the performance of the tax devices implemented in Belgium, Ireland, the Netherlands and the Grand Duchy of Luxemburg. In so doing, the paper gives no indication about possible effects on public finance — namely, the potential loss to other countries.

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[1]See, for example, OECD (1991) — based on Keen's (1990) methodology and Sørensen's (1990) results — CEE (1992), Jorgenson and Landau (1993), EBRD (1993) and Shah (1995) respectively for developed (the first three references), in-transition and developing countries.

[2]The theory on marginal effective tax rates has been developed in many directions. More complex tax schemes have been considered in Alworth (1988) but also in Weichenrieder (1996) and Pierre (1996), who respectively integrated transfer pricing and treaty shopping. The approach has also been extended to specific assets. Goulder and Thalmann (1993) and Boadway and Shah (1995) generalised the capital cost expression in the presence of adjustment costs. McKenzie (1994) introduced the issues of risk and irreversible investments. Mignolet (1998) relaxed the assumption of undifferentiated space. Capital taxes have been enlarged to labour costs in Gerard et al. (1997). In this context, a multiple inputs approach was also proposed by McKenzie, Mintz and Scharf (1997). An overview of the main extensions to the marginal effective tax rates theory is presented in Hespel and Mignolet (1999).

The methodology relies on the theoretical framework developed by Alworth (1988) to measure the capital cost for cross-border investments. This model considers two countries — namely, the parent company's country[3] and the subsidiary's country[4] where the investment takes place. The introduction of finance centres requires the initial model to be extended to a richer framework. Indeed, the finance centre is assumed to act as an intermediary intercepting the funds flowing from the parent to its affiliate and vice versa. Moreover, it is likely to be established in a third country.

If Alworth's model and its extensions have widely proved their relevance and their usefulness for assessing tax policy, they make no pretence of allowing for specific tax rules that could be involved in a particular project.

The remainder of this paper is organised as follows. An overview of the four selected finance centres' regimes is provided in Section II.[5] We essentially focus on tax incentives. Section III displays the methodological framework developed by Alworth (1988) and its extension to the centres' specific tax devices. The aim in Section IV is to measure the capital cost for cross-border investments financed through a tax-aided finance centre. To highlight whether the fiscal environment of the group's parent company is likely to affect location decisions, the model is applied to both a Belgian and a British multinational.

II. THE TAX-AIDED FINANCE CENTRES

This section displays the regimes granted by Ireland, Belgium, the Netherlands and Luxemburg to multinationals' treasury and finance centres. Emphasis is put on the tax incentives that provide multinational companies with the opportunity to perform activities at a low cost. The implications and models of these several incentives are presented in the appendix.

1. Irish Financial Services Company

An Irish financial services company (IFSC) is a company or a branch of a foreign company located in the Custom House Docks area in the centre of Dublin which provides a wide range of financial services to non-residents. The 1987 Finance Act introduced an exceptional tax regime aimed at promoting the setting-up of new companies carrying out international financial activities in the area. The objective was to promote economic activity as well as employment.

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[3]Also called the residence or home country.

[4]Also called the source country.

[5]Alternative use of intermediary companies could easily be handled on the basis of our methodology. For example, the handling of a Dutch company coupled with a Swiss finance branch (which also seems to be a fashionable financial structure) is obviously similar to our 'Luxemburg company with a Swiss finance branch' case.

The profit of an IFSC is taxed at a low corporate tax rate: 10 per cent for business conducted in foreign currencies. This rate, which has been approved by the European Commission, is guaranteed up to 31 December 2005, irrespective of any European tax harmonisation. Moreover, no withholding taxes are levied on interest and dividend payments from the IFSC to non-residents. Generally, being treated for tax purposes as a dividend, interest payments to overseas affiliates are not deductible in Ireland. However, as long as the affiliate is a resident of a treaty country, an IFSC can benefit from the interest deduction. Finally, various other advantages are granted to an IFSC: no municipal tax on property is payable for a period of 10 years; companies renting space in the centre are allowed a tax deduction of twice the rent paid for a period of 10 years; and the cost of fixed assets and buildings qualifies for immediate deduction as expenses in the first year of trading.

A certificate issued by the Finance Minister is required for entitlement to that tax regime. Only qualifying financial activities are eligible for certification. These operations, not restricted to group members, include asset financing, securities trading operations, treasury management, insurance and reinsurance, as well as fund management activities. Moreover, the company is committed to an employment target. Even though law fixes no minimum, as a general rule, the creation of six to ten jobs by the end of the first three years is required.[6] The deadline for applying for an IFSC licence was due to expire at the end of 1994, but the European Commission agreed to extend it to the end of the year 2000.

This exceptional tax device turned Dublin into an attractive location for conducting international financial operations. At the end of 1994, about 446 IFSC approvals had been granted, and now over 200 major international companies use the IFSC as a centre for global treasury activities.[7]

2. Belgian Co-ordination Centre

By 1996, 379 multinational groups of companies had created a co-ordination centre, under the terms of Belgian Royal Decree no. 187 of 30 December 1982, and now benefit from a special tax regime.

Applying for co-ordination centre status is subject to four categories of conditions, relating to the legal form of the company, the employment of 10 full-time staff within two years of activity, the group of companies[8] and, finally, the

[6]Douvier, 1994, p. 11.

[7]According to Citibank N.A. Dublin (see Keogh (1995, p. 17)) and to IDA Ireland (1997).

[8]A group is supposed to include all corporations in which direct or indirect shareholdings represent at least 20 per cent of the share capital or of the voting rights attached to the shares issued. In addition, the consolidated equity and turnover of the group must amount to at least 1 billion and 10 billion Belgian francs respectively. According to the law of 27 December 1984, the group of companies must also have a multinational dimension. To meet this requirement, subsidiaries must be located in at least four different countries and the consolidated equity of the group outside the home country must amount to 500 million Belgian francs or 20 per cent of the

kind of activities performed. The law authorises financial and support services, but restricted to group members (*intra-muros* principle). The latter activities refer, for instance, to advertising, collection and dispatching of information, insurance and reinsurance, scientific research, relations with national and international authorities, and centralisation of accounting, administration and data processing. Financial services, on the other hand, include centralisation of group financial management, group financing, reinvoicing, factoring, financial leasing, and netting and hedging activities.

If the above conditions are met, the co-ordination centre is recognised for 10 years. This approval is renewable and enables companies to benefit from the following tax incentives.

Even though a co-ordination centre is subject to the common-law corporate tax rate, its tax base does not coincide with actual profits but is reduced to a percentage of operating costs, excluding personnel costs, financing costs and corporate income tax.[9] This notional tax basis is said to be determined according to the *cost-plus* method. The percentage generally corresponds to the mark-up applied by the co-ordination centre for its services to group companies. If no percentage is determined, the rate applied is 8 per cent.

The second main advantage is the exemption from withholding taxes on the payment of dividends, interest and royalties by a co-ordination centre to companies of its group. Similarly, there is no withholding tax on interest received by a co-ordination centre on its bank deposits in Belgium. Double tax treaties are to be invoked for dividends and interest received from abroad.

Some advantages granted to Belgian co-ordination centres have been progressively reduced. Indeed, until 23 July 1991, dividends and interest paid by a co-ordination centre to a Belgian company were grossed up by the amount of a fictitious withholding tax. The beneficiary of the revenue was allowed to credit a certain amount[10] on its tax liability even though no withholding tax had been initially collected. This advantage, considered as a subsidy, was granted provided that the funds had been used for financing new investments in Belgium. Although the fictitious withholding tax rate has been reduced to zero, payments relating to investments or loans concluded before 23 July 1991 may still benefit from a fictitious withholding tax.

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consolidated capital. Furthermore, the turnover abroad must reach 5 billion Belgian francs or 20 per cent of the consolidated turnover of the group.

[9]A minimum amount is, however, required for the lump-sum tax basis: the sum of the expenses and charges not deductible as operating costs plus the abnormal and gratuitous advantages granted by members of the group to the centre.

[10]The reduction amounted to $^{25}/_{75}$ of the net revenue for dividends (interest) resulting from investments (loans) carried out before 23 July 1990 (22 January 1990) and to $^{10}/_{90}$ for dividends (interest) from investments (loans) carried out from 23 July 1990 (22 January 1990) to 23 July 1991 (23 July 1991). In addition, the incentive for dividend remittances was limited to 7.5 per cent of the not yet reimbursed or amortised capital of the centre.

Since January 1993, a new yearly tax of 400,000 Belgian francs per employee, with a maximum of 4,000,000 Belgian francs, is also collected.

In spite of this reduction in incentives during the last decade, the regime of co-ordination centres seems to remain popular among multinational groups of corporations, especially American and Belgian ones. It is essentially the important reduction in tax base and the exemption from withholding taxes which enable multinationals to carry out transactions with group companies at a very low cost.

3. Dutch Finance Company

Aimed at dealing with the financial operations of a group of companies, the Dutch finance centre is subject to the general tax law. However, it benefits from an exceptional tax treatment based on advance rulings as regards its tax base. In addition, the participation exemption, the absence of withholding tax on interest payments and an extensive treaty network are features of the Dutch tax system that help attract multinational companies. However, because of Irish and Belgian tax competition, multinationals' financing activities for an estimated 15 billion Dutch guilders have been transferred outside the Netherlands.[11] Hence, on 23 April 1996, the Dutch authorities passed a new law aimed at stimulating multinationals to relocate their finance companies to the Netherlands.

According to the new regime, Dutch finance companies that are part of an international group benefit from a reduced effective tax rate of 7 per cent for the profit resulting from intra-group financing activities and some short-term portfolio investments. Such companies are indeed allowed to 'set up a tax-deductible provision in connection with currency exchange risks and bad debt risks up to 80% of the annual financing income generated'.[12] The common-law corporate tax rate of 35 per cent applies to the remaining profit.

Depending on prevailing circumstances, releases from the reserve are subject to different tax schemes. For instance, voluntary reduction of the reserve in five equal annual instalments gives rise to a 10 per cent tax. Tax-free releases may occur in the event of capital contributions in connection with specific matters. When facing a loss that the reserve is intended to cover, an amount of the reserve equal to such a loss will be added to taxable income. Finally, in the case of liquidation of the corporation or when requirements for constituting the reserve and for being resident in the Netherlands are not met anymore, the reserve becomes fully taxable.

[11]In De Braekt, 1997, p. 3.
[12]De Zeeuw, 1996, p. 14.

The application of the new tax regime is subject to advance confirmation through the issue of a tax ruling[13] which applies for a period of 10 years and which can be renewed.

With the reform implemented in 1996,[14] the Netherlands has enhanced its attractiveness as a location for multinational corporations. The status seems to be of particular interest as the scope of activities is in no way limited to the above-mentioned inter-company financing activities. Indeed, holding activities and support services, for instance, are allowed, though these operations do not benefit from the 7 per cent taxation. 'The Dutch tax treatment of a treasury operation depends on the nature of the activities carried out.'[15]

4. Luxemburg Company with a Swiss Finance Branch

In treasury circles, a Swiss finance branch of a parent company resident in the Netherlands or the Grand Duchy of Luxemburg is considered to be a tax-efficient structure for group financing activities. The 1994 Switzerland–Luxemburg double tax treaty especially turned Luxemburg into an attractive location for a holding company with a Swiss branch in charge of treasury and financial operations.

To be considered as a permanent establishment and to benefit from the tax advantages in Switzerland, the branch is required to have sufficient substance. According to the treaty, its profits are taxed in Switzerland and exempted in Luxemburg. However, this country's tax authorities consider a small fraction of the branch's profits to be attached to the parent company, so that taxation occurs in both countries but still remains low, as explained below.

In Switzerland, owing to a circular letter of October 1989 completed by a 1995 decision, the federal taxation of a finance branch is similar to taxation of a bank: $^{10}/_{11}$ of the branch's profits are likely to be used for paying creditors and may then be deducted from the tax base, provided that the branch maintains a spread of 10 per cent. This provision results in a tax base equalling 17.35 per cent of the net benefit before interest deduction.

This incentive is subject to several conditions. For instance, the branch's average balance sheet is required to reach 100 million Swiss francs, 75 per cent of which has to be related to financial services. Moreover, at least 75 per cent of

[13]Several conditions are required. The finance centre must be either a resident company or a permanent establishment of a non-resident company with sufficient substance. Its activities must be carried out exclusively from within the Netherlands for group companies resident in at least four countries or two continents. Moreover, at least 5 per cent of the gross income from inter-company financing activities should be derived from each country, or at least 10 per cent should be derived from each continent, where group companies that have obtained financing from the Netherlands are resident. Finally, the capital proportion used to finance Dutch companies of the group is limited to the lower of 10 per cent and the ratio of the fair market value of the group's assets in the Netherlands to its aggregate world-wide assets.

[14]Effective since 1 January 1997.

[15]De Zeeuw, 1996, p. 15.

the gross income is to be derived from interest or the reduction of currency and associated risks. Services can be provided to related companies as well as to third parties, but loans to Swiss group companies must be limited to 10 per cent of the balance-sheet total.

In addition to the corporate tax, a federal annual tax on capital is levied at the rate of 0.08 per cent on $^{1}/_{11}$ of the total balance sheet. And for cantonal tax purposes, a wide range of exceptional rulings may reduce cantonal income taxes to zero (for instance, in Geneva, Fribourg and Zoug). As regards the 35 per cent withholding tax on dividend remittances to the head office, the Switzerland–Luxemburg double tax treaty provides an exemption.

In Luxemburg, a head office incorporated under the general tax law helps make the structure more attractive by enabling it to invoke the double taxation treaties. Both a finance company and a Soparfi ('société de participations financières' or financial participation company) turn out to meet this requirement. For instance, the Soparfi, which is aimed at acquiring and managing shares from other corporations, is taxed at the common-law corporate tax rate on 5 per cent of the branch's profits. To avoid international double taxation, a credit of 5 per cent of the Swiss tax liability is allowed.

The Swiss finance branch of a Luxemburg company then seems attractive for treasury operations due to the comprehensive network of double taxation treaties concluded by Luxemburg as well as the favourable tax incentives granted to Swiss finance branches.

III. ALWORTH'S (1988) MODEL AND ITS EXTENSION

With the help of the cost of capital concept, we set out to assess the tax advantage resulting from the use of a tax-aided financial services centre to finance multinationals' cross-border investments.[16]

The cost of capital expresses the before-tax minimum rate of return that an investment must yield in order to be profitable. Generally derived in the context of the dynamic neo-classical theory of the firm, it focuses on the marginal, just profitable, unit of capital that equalises its return and cost. Consequently, the cost of capital measures the marginal product required to cover all the costs relating to the additional unit invested.

This concept underpinning the effective tax rates theory is quite exhaustive. Indeed, in addition to the cost of financing investments, this forward-looking measure captures the effects of the general inflation rate, the real growth rate of capital price and the asset economic rate of depreciation. Moreover, all provisions of the tax system that may affect the investment return, including amortisation allowances and capital incentives, are considered.

[16]We consider investments in real capital.

Tax provisions turn out to be a substantial determinant of the cost of capital. Indeed, personal and corporate taxes considerably increase the minimum return required to provide the finance supplier with the same net yield. Likewise, the cost of capital is reduced by subsidies or any capital incentive. Given the numerous tax advantages finance centres benefit from, it seems interesting to determine to what extent the cost of capital for investments made by multinationals is affected when a tax-aided finance centre intervenes in the financing process of investment.

Let us consider a parent company located in the home country that totally holds a foreign subsidiary in charge of investing in its country of location. In this context, we intend to compare the capital cost values with respect to the two following financing situations:[17]

- the multinational's parent company endows its foreign subsidiary with the funds for investing, either by granting a loan or by buying its shares;
- the multinational's parent company finances its foreign subsidiary through the group's finance centre which uses the funds obtained from the sale of new shares to the parent company to grant a loan to the affiliate. We opt for this specific financial arrangement including a loan from the finance centre to the subsidiary because some centres — for instance, the Belgian co-ordination centres — are not allowed to hold interest in other entities. This restriction is not binding for all centres. But in order to provide a comparison that is not biased by financing arrangements, the granting of a loan by the centre to the subsidiary has been considered for all cases.

For each case, the ultimate provider of funds in the domestic country is also specified. We assume that the parent company supplies finance in one of three ways: by borrowing from a bank, by using retained profits or by issuing new shares. The situations to compare can be depicted as in Figures 1 and 2.

The cost of capital expression for the situation depicted in Figure 1 has been developed in Alworth (1988). Enlarging the seminal King and Fullerton (1984) approach to cross-border investments, Alworth has extended the theoretical framework to include the complex matter of international taxation. In addition to the systems alleviating economic double taxation,[18] his model integrates the systems aimed at preventing international double taxation of dividends to the capital cost measure. This refers to taxation by different national jurisdictions of the same income within the same entity.[19] However, three basic methods may be invoked in bilateral treaties in order to alleviate such double taxation: the

[17]For the purpose of this study, only the parent-dependent financing schemes are relevant. It is indeed obvious that if the subsidiary uses its retained profits to finance the investment, the presence of an intermediate financial company has no effect on the firm cost of capital.

[18]Economic double taxation is when a country taxes a corporate and a personal taxpayer on the same revenue.

[19]The parent company and subsidiary are considered to be the same company.

exemption, deduction and credit systems. In the first case, the revenue is simply exempted from tax in the home country. According to the deduction principle, the home country considers as tax base the total revenue generated by the investment less foreign taxes. Finally, under the credit mechanism, the domestic tax base is the full revenue generated by the affiliate, but taxes paid abroad can be totally or partially used to reduce the domestic tax liability. If the foreign tax is higher than the domestic tax, the situation of *excess credit* is said to occur, and generally no reimbursement of the surplus of the foreign tax over the home-country tax is provided. The two latter systems may occur with or without deferral.[20]

FIGURE 1

Financing Schemes without a Finance Centre

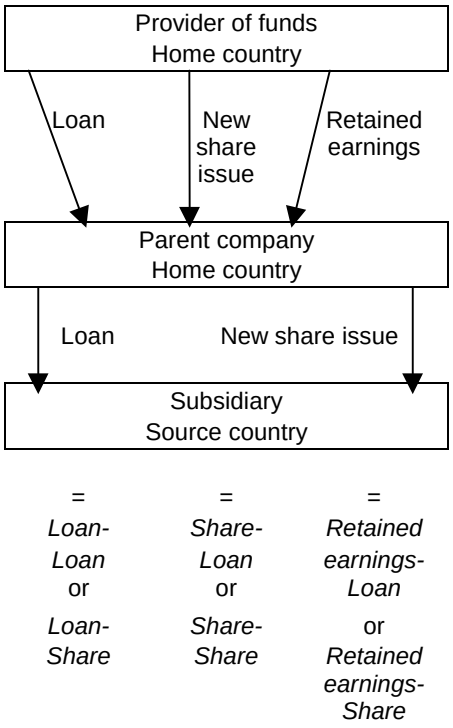
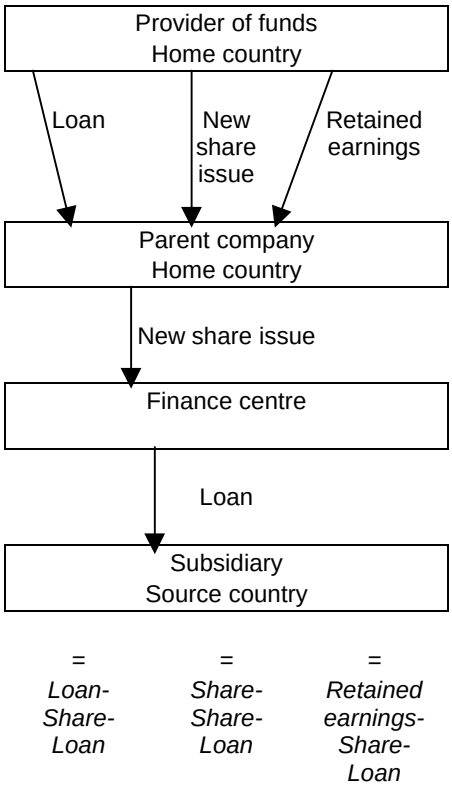


FIGURE 2

Financing Schemes involving a Finance Centre



Note: 'Share' stands for share issue, 'Loan' for loan and 'Retained earnings' for retained profits.

[20]Deferral means that the subsidiary's profits are subject to the home-country tax only when repatriated.

The situation depicted in Figure 2 and involving finance centres is an important area on tax incentives for international investment which seems to have received little attention in the economics literature, or more particularly the effective tax rates theory. So, to evaluate the cost of capital on investments financed through a finance centre, we set out to extend the model developed in Alworth (1988).[21]

The major contribution regards the change in financing methods and hence in financing costs.[22] The amount of funds (dividends or interest) received by the parent company is now affected by the tax incurred by the finance centre. The tax devices being specific to each centre, a new financing cost expression has been provided for each of them. Moreover, as we also aim to assess the impact of the double tax relief implemented by the home country, the expressions are set up considering two different home countries' tax systems: the partial exemption system used in Belgium and the credit system applied in the UK.

For the sake of simplicity, the mathematical developments on the capital cost expression underpinning Alworth's (1988) model, as well as the main transformations from a 'two-entities' to a 'three-entities' model, are summarised in the appendix.

IV. APPLICATIONS

Relying on the model presented in the appendix, we measure the capital cost of investment when the following financing schemes are implemented: we consider either a Belgian or a British multinational and assume that the investment is located in the Netherlands, Luxemburg, Italy, Germany or the US. First, we specify the main assumptions regarding tax provisions (tax rates, systems preventing double taxation, etc.) and values given to parameters of the model.

1. Assumptions

Alworth's (1988) model and its extension accounting for tax-aided treasury centres are implemented assuming an 8 per cent interest rate as well as an expected 2 per cent inflation rate on capital goods. The investment asset is supposed to depreciate at the exponential rate, constant over time, of 20 per cent a year. As regards the tax parameters, Table 1 shows the values of corporate tax

[21]The approach was first developed by Hespel (1997), who highlighted the tax advantage associated with Belgian co-ordination centres.

[22]The financing cost is the only parameter of the capital cost that is affected by the enlargement of Alworth's (1988) model to include finance centres, as the subsidiary is only allowed to transfer interest via the finance centre. In case of dividend remittances to the parent company, the finance centre is not involved in the operation.

TABLE 1

Corporate Tax Rates

Per cent

Germany	*Luxemburg*	*Italy*	*Netherlands*	*Switzerland*	*Belgium*	*UK*	*US*
43.77 57.15[a]	40.29[b]	53.2[c]	35[d]	9.8[e]	40.17[f]	33	37.96[g]

[a]Germany has two corporate tax rates: 45 per cent for undistributed profits and 30 per cent for distributed earnings. When including an excess burden (7.5 per cent) in force since 1995, the two rates become 48.375 per cent and 32.25 per cent respectively. Moreover, a trade tax varying between 15 and 25 per cent is levied by local authorities. Let us assume an average burden of 17 per cent. So the tax rates considered are 0.17 + 0.48375 – (0.17 × 0.48375) = 0.5715 for retained earnings and 0.17 + 0.3225 – (0.17 × 0.3225) = 0.4377 for distributed profits.

[b]The Luxemburg basic rate of corporate income tax is 33 per cent. It is subject to a 4 per cent overload. The rate is therefore equal to 0.33 × 1.04 = 0.3432. The municipalities levy an additional tax on income — 9.09 per cent, for example, in Luxemburg City — which is deductible from net income for calculating state income tax. Hence the rate amounts to 0.0909 + 0.3432 – (0.0909 × 0.3432) = 0.4029.

[c]The rate of corporate income tax (IRPEG) is 37 per cent in Italy. It is increased by the local income tax (ILOR), the rate of which is 16.2 per cent.

[d]In the Netherlands, the first 100,000 guilders are taxable at 37 per cent. Earnings in excess of that amount are taxed at 35 per cent.

[e]That is, the upper federal corporate tax rate.

[f]In Belgium, the basic corporate tax rate amounts to 39 per cent. Since 1993, an additional crisis contribution of 3 per cent has applied to all income taxes. The rate is then 0.39 × 1.03 = 0.4017.

[g]For any revenue between $335,000 and $10,000,000, a tax rate of 34 per cent is applied. Moreover, the state and local governments levy various taxes which may reach 12 per cent or more (let us suppose an average of 6 per cent). These taxes are deductible in such a way that the tax rate is 0.34 + 0.06 – (0.34 × 0.06) = 0.3796.

Source: Yost, 1997.

rates in the countries considered. All the fiscal devices used in our applications reflect the national tax codes in force on 31 July 1996.[23]

To avoid international double taxation, Belgium applies the principle of ‘revenus définitivement taxés’ (definitively taxed income), commonly called RDT. This system provides an exemption of up to 95 per cent of net dividends received. In the UK, companies are given a credit for foreign taxes.

Controlled foreign company (CFC) rules may be ignored here because the firm is supposed to pursue an ‘acceptable distribution policy’, which is the case when the CFCs ‘pay at least 90 % of their profits back to the UK as dividend’.[24] In our scenario, we assume that the whole foreign profit is repatriated every year.

With the European Parent–Subsidiary Directive, the withholding tax on dividend remittances between European countries is reduced to zero. The US, on the other hand, levies a 5 per cent withholding tax on dividend payments towards Belgium.

[23]Accordingly, this exercise does not allow for the imputation system reform implemented in the UK in 1997.

[24]See www.inlandrevenue.gov.uk/feedback/cfc.htm.

For foreign withholding taxes on interest received, Belgium grants a credit called QFIE.[25] The credit rate varies according to the source country: as regards Italy and the US, the 15 per cent interest withholding tax is totally offset by a 100 per cent credit rate. A 10 per cent tax is also withheld on interest remittances from Italy towards the UK, Ireland, Luxemburg and the Netherlands.

Since 1989, Belgium has stopped providing an economic double tax relief. The personal tax rates on interest and dividend payments amount to 15 per cent and 25 per cent respectively. No capital gains tax is levied. In the UK, on the other hand, personal shareholders are allowed to credit 25 per cent of the dividend against their tax burden.[26] The highest personal tax rate of 40 per cent is the value assigned to the personal tax rate on interest and dividends received as well as to the capital gains tax rate.

2. Results

The numerical values for capital cost are displayed in Table 2 for the Belgian case and Table 3 for the British case.

Table 2 gives evidence that finance centres effectively reduce the cost of capital for investments made by multinationals. With the parent company borrowing, issuing shares or using retained profits, the capital cost is always lower when a treasury centre is involved in the investment financing process. The results also bring out the impact of different financial arrangements on the cost of capital. The cheapest financial arrangements feature a bank loan to the parent company, independently of the use of a treasury centre. It is followed in turn by retained earnings and share issue. The multinational is expected to choose the cheapest financing method. But the cost also varies according to both the treasury centre and the affiliate location.

Generally, the co-ordination centre provides the lowest capital cost, whereas the Luxemburg company with a Swiss finance branch and the IFSC respectively hold the second and third positions. There are exceptions to this hierarchy when investing in Italy and the US. As regards the latter country, the Luxemburg company with a Swiss finance branch provides the lowest required return. The cost of capital for an investment in Italy is minimised with the IFSC intermediation.

The Dutch finance company turns out to provide the least attractive financing scheme. According to Dutch tax law, 20 per cent of the profits are taxed at the

[25]'Quotité forfaitaire d'impôt étranger'.

[26]The dividend grossed up by the amount of the credit is the shareholder's tax base. The amount of the credit (ACT) must be advanced by the company and is later deducted from its tax liability. In the case of a dividend paid out from foreign-source profits, the ACT is refundable (since 1 July 1994) to prevent any ACT surplus resulting from the pre-eminence of foreign taxes and ACT on the domestic tax. In this case, however, the credit is non-refundable to the final shareholder. ACT was abolished on 5 April 1999.

TABLE 2

Cost of Capital: The Case of a Belgian Parent Company

Per cent

	Country of investment				
	US	*Italy*	*Netherlands*	*Luxemburg*	*Germany*
No finance centre					
Loan-Loan[a]	5.93	5.84	5.95	5.92	5.90
Loan-Share	6.22	8.31	5.45	6.10	6.60
Share-Loan	13.56	15.45	12.85	13.45	13.90
Share-Share	13.86	18.01	12.35	13.64	14.62
Retained earnings-Loan	9.54	10.69	9.10	9.47	9.74
Retained earnings-Share	9.79	12.83	8.68	9.63	10.35
IFSC					
Loan-Share-Loan[b]	1.98	0.93	2.36	2.02	1.77
Share-Share-Loan	9.49	10.31	9.17	9.44	9.63
Retained earnings-Share-Loan	6.12	6.39	6.01	6.09	6.16
Co-ordination centre[c]					
Loan-Share-Loan[b]	2.66	1.76	1.13	0.70	0.38
Share-Share-Loan	10.19	11.19	7.91	8.06	8.17
Retained earnings-Share-Loan	6.71	7.13	4.95	4.94	4.94
Dutch finance company					
Loan-Share-Loan[b]	3.59	3.10	3.91	3.58	3.34
Share-Share-Loan	12.38	14.13	11.79	12.19	12.49
Retained earnings-Share-Loan	8.08	9.03	7.80	7.97	8.09
Luxemburg company with a Swiss finance branch					
Loan-Share-Loan[b]	1.13	1.48	1.58	1.18	0.88
Share-Share-Loan	8.61	10.88	8.37	8.56	8.70
Retained earnings-Share-Loan	5.38	6.87	5.33	5.36	5.38

[a]The parent company borrows from a bank to lend to the subsidiary.
[b]The parent company borrows from a bank to buy new shares issued by the finance centre; the latter finances the subsidiary with a loan.
[c]Since 1991, new investments in Belgium have not benefited from a fictitious withholding tax. The impact of this provision is, however, worth emphasising. On average, the capital cost attached to a co-ordination centre would have been reduced from 0.5 per cent for a $^{10}/_{90}$ fictitious withholding tax and from 1.5 per cent for a $^{25}/_{75}$ fictitious withholding tax.

common-law corporate tax rate of 35 per cent and the remaining 80 per cent constitute a tax-free reserve. Assuming a reduction of the reserve in five equal instalments over a period of five years, the 10 per cent rate is applicable.

Consequently, in present value, the Dutch effective tax rate amounts to at least 15 per cent, which is greater than the rate applied in the other centres' locations.

The results for the British multinational are shown in Table 3. The use of a British multinational's headquarters to finance a foreign investment project may also provide a tax saving, but only when the affiliate was initially financed by a share issue. The Dutch finance company turns out to be unattractive in most cases. Unlike the Belgian situation, there is no preference for a specific location for the finance centre, whatever the source country. The imputation tax system implemented in the UK largely explains this. The limitation of credit to the domestic tax results in the income being liable to at least the UK rate. When Alworth (1988) considers a loan to the affiliate, the income is exempted abroad and is simply taxed in the UK. In the case of dividend payments, however, the generally high European rates lead to excess credit situations which contribute to increasing the effective tax rate on income. Being only slightly taxed, treasury centres enable companies to avoid such a penalty.

TABLE 3

Cost of Capital: The Case of a British Parent Company

Per cent

	Country of investment				
	US	*Italy*	*Netherlands*	*Luxemburg*	*Germany*
No finance centre					
Loan-Loan[a]	5.94	5.84	5.95	5.93	5.91
Loan-Share	7.05	9.36	6.20	6.92	7.47
Share-Loan	7.74	8.10	7.58	7.70	7.79
Share-Share	8.86	11.65	7.83	8.70	9.36
Retained earnings-Loan	11.01	10.72	10.05	10.20	10.32
Retained earnings-Share	12.51	15.21	10.36	11.47	12.31
Co-ordination centre, IFSC, Luxemburg company with a Swiss finance branch					
Loan-Share-Loan[b]	5.94	5.84	5.95	5.93	5.91
Share-Share-Loan	7.74	8.10	7.58	7.70	7.79
Retained earnings-Share-Loan	11.01	10.72	10.05	10.20	10.32
Dutch finance company					
Loan-Share-Loan[b]	7.12	7.58	7.05	7.04	7.03
Share-Share-Loan	9.12	10.11	8.86	9.01	9.13
Retained earnings-Share-Loan	13.35	13.70	12.02	12.13	12.40

[a]The parent company borrows from a bank to lend to the subsidiary.
[b]The parent company borrows from a bank to buy new shares issued by the finance centre; the latter finances the subsidiary with a loan.

The specific results for the Dutch finance company are due to the assumption that the dividend payments are spread over time. The amount not constituting the reserve is subject to the 35 per cent rate in the Netherlands. When this revenue is distributed, the parent company is in an excess credit position. This is not the case for the five following dividend payments stemming from the reserve reduction.

Borrowing to buy shares from a treasury centre which grants a loan to the affiliate again leads to the lowest capital cost. It may, however, not be cheaper than the double loan policy.

We note, from Tables 2 and 3, that the capital cost is generally lower for the Belgian multinational when the parent company borrows funds or uses retained earnings. This arises from the lower UK corporate tax rate, which reduces the tax saving on interest deduction, as well as from the positive UK tax on capital gains. In the event of a new share issue by the parent company, it is the capital cost of a British multinational investment which is lower, owing to the UK alleviation of economic double taxation.

From the perspective of abolition of tax-aided finance centres in Europe, as recommended by the European Council's code of conduct, Tables 2 and 3 also emphasise that, if implemented, the code of conduct would be unevenly borne by multinational groups, according to the location of their centre and the nationality of the parent company. Indeed, in the Belgian case, the tax advantage resulting from the finance centre is substantial, whatever the financial arrangement considered. In contrast, the UK group bears the same capital cost on investments whether the parent company grants a loan to its subsidiary or uses the group's finance centre. In this case, the cost of investments in Europe is not increased.

V. CONCLUSION

This paper has examined the impact of tax incentives on the location decision of a group's treasury centre in order to finance cross-border investments. Owing to their exceptional tax regimes, Irish financial services companies, Belgian co-ordination centres, Dutch finance companies and Luxemburg companies with a Swiss finance branch were considered as rival statuses and assessed.

The methodology, stemming from the marginal effective tax rates theory, implied the measurement of the capital cost when the multinational group did or did not include one of the treasury and finance centres mentioned above. Our contribution consisted of extending Alworth's (1988) model in order to account for the intermediation of a finance centre. In order to provide an unbiased comparison, the specific financial arrangement including a loan granted by the treasury centre to the subsidiary was considered in all cases.

The results give evidence that the selected treasury centres enable companies to lower the capital cost significantly. The advantage, however, depends on the tax system in force in the home country. In this respect, two systems have been

considered: the partial exemption system (RDT) applied in Belgium and the credit system used in the UK. In the Belgian case, the use of a treasury centre always provides a tax saving that increases with the incentives granted to the centre. Depending on the source country, Belgium, Ireland or Luxemburg turns out to be the best location choice for a treasury or finance centre. In the UK application, the new financing schemes simply enable companies to avoid excess credit situations. The revenue finally bears the domestic corporate tax rate and no preference is given to a specific centre. The results differ for the Dutch finance company, which turns out to be unattractive in most cases.

In the context of European tax harmonisation, implementation of the tax code of conduct is likely to lead to the dismantling of finance centres in Europe. In this respect, the results emphasise that this decision would be unevenly supported by multinational groups and would substantially reduce the attractiveness of some countries for foreign investments.

APPENDIX: ALWORTH'S (1988) MODEL AND FINANCE CENTRES

In this appendix, we first present Alworth's (1988) model, before showing how the financing cost is affected by introducing a finance centre.

For the purpose of deriving a mathematical expression for the cost of capital, Alworth relies on the dynamic neo-classical theory of the firm. Considering a partial equilibrium model, the firm's optimisation programme consists of choosing an investment strategy that maximises its shareholders' wealth — that is, the market value of the firm. The maximisation function is as follows: the present value of the investment project (V) is assumed to equal the sum of the gross future return (c) subject to a corporate tax rate τ^*, discounted at rate N, corrected by prices of capital goods ($\pi + \pi_k$),[27] after accounting for depreciation at the exponential rate δ.

$$V = \int_0^{\infty} c(1-\tau^*)e^{-[(N-\pi)+(\delta-\pi_k)]u}\mathrm{d}u = \frac{(1-\tau^*)c}{(N-\pi)+(\delta-\pi_k)}.$$

The result of this expression is the yield of investment. According to the neo-classical assumption of marginal investment, it equals its net cost: one monetary unit less the present value of public advantage (A)[28] due to tax allowances and any capital subsidy.

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[27] π is the general inflation rate and π_k denotes the real inflation rate on capital goods.

[28] A stands for the investment expense that qualifies for standard depreciation allowance, which is entitled to deduction as expenses and on which a capital subsidy can be granted. The tax gain resulting from a linear

Hence, the expressions obtained for the gross-of-depreciation cost of capital and the net-of-depreciation cost of capital are

$$c = \frac{(1-A)}{(1-\tau^*)}\left[(N-\pi)+(\delta-\pi_k)\right]$$

and

$$p = c - \left[\delta - \pi_k\right].$$

The effective tax rate parameter, τ^*, accounts for the various taxes collected on foreign dividend repatriation: the source and home countries' corporate income taxes and any dividend withholding tax. In addition, systems of company taxation for avoiding international as well as economic double taxation are integrated. Alworth expresses τ^* as

$$\tau^* = \tau_f + \frac{(\alpha\tau_m - \mu\tau_f)\theta_m}{\theta^*} \qquad \text{and} \qquad \theta^* = \theta_m[\theta_f + \sigma(1-\theta_f)],$$

where:

τ_m is the home country's corporate tax rate;

τ_f is the source country's corporate tax rate;

α is the proportion of foreign investment return considered as tax base in the home country;

μ is the proportion of foreign corporate tax creditable against the domestic tax liability;

σ is the proportion of foreign dividend withholding tax creditable against the domestic tax liability;

θ_f is the opportunity cost of retaining earnings in the affiliate in terms of gross dividends in the hands of the parent company: when the affiliate distributes one monetary unit, the parent company obtains θ_f monetary units before taxation;

θ_m is defined as the opportunity cost of retaining earnings in the parent company in terms of dividends before personal taxes in the hands of the final shareholder;

θ^* is the before-tax amount obtained by the final shareholder when the subsidiary distributes one unit of profit.

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depreciation allowance is given by $\int_0^L \tau^* \frac{1}{L} e^{-Nu} \mathrm{d}u = \frac{\tau^*(1-e^{-NL})}{NL}$ where L is the depreciation period for tax purposes.

The N variable denotes the financial cost of investment — that is, the discount rate. Alworth considers various financing schemes having their own tax consequences and cost. For the purpose of this study, only the parent-dependent financing possibilities are relevant:

- the parent company borrows from a bank — to lend to the subsidiary (N_{LL});
  — to buy new shares issued by the subsidiary (N_{LS});
- the parent company uses its retained profits — to lend to the subsidiary (N_{RL});
  — to buy new shares issued by the subsidiary (N_{RS});
- the parent company issues new shares — to lend to the subsidiary (N_{SL});
  — to buy new shares issued by the subsidiary (N_{SS}).

Alworth uses the capital market equilibrium condition[29] to derive the financial cost of capital under those alternative financing policies. Therefore the expression for N is made up of several terms, as shown in Table A.1.[30]

The first term of these equations refers to the cost borne by the parent company for its loan, share issue or use of retained earnings. In the case of a loan, a proportion γ of the interest r is deductible from the tax base. The cost of a new share issue is the dividend due to the shareholder who requires that the net return on a share equals the after-tax yield received on a loan. m_s and m_b are the personal tax rates on dividends and interest respectively. The ratio of θ_m to θ^* simply makes the cash flows of the parent company and subsidiary comparable by expressing them in terms of gross income in the hands of the personal shareholder. When the parent company raises funds through retained earnings, the capital gain required by the saver to leave its profits within the company must also equal the yield received on a loan. Z is the personal tax rate on accrued capital gains.

When the affiliate borrows a monetary unit, a cost $r'(1-\gamma^*\tau^*)$ is borne, where r' is the interest rate and γ^* the interest proportion deductible from the tax base.

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[29]'For a binational firm this condition states that in the absence of uncertainty the yield on investing in a firm deriving its income from abroad is equal to that on any particular asset purchased domestically' (Alworth, 1988, p. 124).

[30]For further details about the complex methodology for deriving the financial cost of capital, see Alworth (1988, pp. 124–42).

TABLE A.1

Expressions of Financing Costs, *N*

Financing of the parent company	*Financing of the subsidiary*	
	Loan	Share issue
Loan	$N_{LL} = \frac{\theta_m}{\theta^*} r(1-\gamma\tau_m) + r'(1-\gamma^*\tau^*)$ $-\frac{\theta_m}{\theta^*} r'[1-w_f(1-\mu_b)-\tau_m]$	$N_{LS} = \frac{\theta_m}{\theta^*} r(1-\gamma\tau_m)$
Share issue	$N_{SL} = \frac{r(1-m_b)}{\theta^*(1-m_s)} + r'(1-\gamma^*\tau^*)$ $-\frac{\theta_m}{\theta^*} r'[1-w_f(1-\mu_b)-\tau_m]$	$N_{SS} = \frac{r(1-m_b)}{\theta^*(1-m_s)}$
Retained earnings	$N_{RL} = \frac{r(1-m_b)}{(\theta^*-\theta_m)+(1-Z)} + \frac{r'(1-\gamma^*\tau^*)\theta^*(1-m_b)}{(\theta^*-\theta_m)+(1-Z)}$ $-\frac{\theta_m r'(1-m_b)[1-w_f(1-\mu_b)-\tau_m]}{(\theta^*-\theta_m)+(1-Z)}$	$N_{RS} = \frac{r(1-m_b)}{(\theta^*-\theta_m)+(1-Z)}$

Note: The terms of these mathematical expressions have been rearranged by the authors.
Source: Alworth, 1988, p. 142.

Some equations include a third term which relates to the loan granted by the parent company to its affiliate. The interest received by the parent company contributes to decreasing the financial cost. It is, however, subject to a possible withholding tax at rate w_f and to the home country's corporate tax. The symbol μ_b stands for possible crediting of the interest withholding tax.

When the subsidiary issues new shares, the expression for the financial cost of capital becomes simpler, as the second and third terms, relating to the loan granted to the affiliate, are missing.[31]

When enlarging Alworth's model to include finance centres, the mathematical expression of the financing cost is the only parameter of the capital cost that is altered. Indeed, we assume that the subsidiary is only allowed to transfer interest via the finance centre. Therefore, in the case of dividend remittances to the parent company, the finance centre is not involved in the operation.

The presence of finance centres alters financing policies. Let us model the following cases:

- the parent company borrows from a bank to buy new shares issued by the finance centre; the latter finances the subsidiary with a loan (N_{LSL});

[31]In Alworth's (1988) model, the tax burden on dividend remittances to the parent company is already handled through the parameter τ^*.

- the parent company uses its retained profits to buy new shares issued by the treasury centre; the latter finances the subsidiary with a loan (N_{RSL});
- the parent company issues shares to buy new shares issued by the treasury centre; the latter finances the subsidiary with a loan (N_{SSL}).

These new financing methods all include a loan to the subsidiary. Hence, following Alworth (1988), the financing cost expressions will have three terms. The first and second ones, relating to the raising of funds by the parent company and the cost borne by the subsidiary for its loan, are not altered. However, the third term, expressing the net revenue collected by the parent company, now has to account for the presence of a finance centre. It corresponds to the interest paid by the subsidiary after collection of the interest withholding tax in the source country, the corporate and withholding taxes borne by the treasury centre and, finally, the home country's corporate tax. The tax system implemented in the UK being different from the one in Belgium, the impact on the final expression is specific to each country and has to be dealt with separately. Boxes A.1 and A.2 give the financing costs implied by a treasury or finance centre. Only the alternative version of the third term[32] in the 'Loan' column of Table A.1 is presented, the first and second terms being unchanged.

1. A Belgian Parent Company

The Belgian tax law relies on the 5 per cent (α) taxation (at rate τ_m) of the net dividend received (RDT provision).[33] Hence essential elements for determining the Belgian tax base are the amount of the foreign interest withholding tax (w_f) and the finance centre's tax liability.

See overleaf.

[32]When the parent company uses retained earnings, the expressions have to be multiplied by $\frac{\theta^*(1-m_b)}{(\theta^*-\theta_m)+(1-Z)}$.

[33]The Belgian tax authorities are presently trying to exclude from the benefit of the RDT provision the dividends paid by an IFSC and other financing companies. A difficulty arises because the Belgian authorities do not want to exclude their own co-ordination centres.

BOX A.1

Parent Company's Revenue (third term of financing cost expression): The Case of a Belgian Parent Company

Irish Financial Services Company

As Ireland grants a credit for foreign taxes, the income received in Belgium amounts to the source-country interest payment (r') minus the greater of the source-country interest withholding tax (w_f) and the Irish corporate tax (10 per cent). An interest withholding tax exceeding 10 per cent would indeed reduce the dividend payment to the parent company. The symbol a takes into account that part of any interest withholding tax exceeding the 10 per cent Irish tax rate, and θ_m / θ^* simply makes it possible to compare the cash flows of the parent company and the subsidiary.

$$\frac{\theta_m}{\theta^*} r'[1-0.1-a(w_f-0.1)](1-\alpha\tau_m),$$

where $a = 1$ if $w_f > 0.1$ and $a = 0$ if $w_f \leq 0.1$.

Belgian Co-ordination Centre

The additional investment unit is supposed to alter neither the volume of personnel nor the non-financial costs, so that exemption can be considered within the co-ordination centre. Consequently, the dividend collected by the parent company has, at most, been subject to the source country's potential interest withholding tax (w_f). Moreover, a possible fictitious withholding tax (pmf_d) may gross up the dividend received, with a limit of ε per cent.

$$\frac{\theta_m}{\theta^*} r'(1-w_f)(1+\varepsilon\, pmf_d)(1-\alpha\tau_m).$$

Dutch Finance Company

In order to model the structure involving a Dutch finance company, an assumption is required as regards the later tax treatment of the reserve. We suppose a voluntary reduction of the reserve in five equal annual instalments starting the year following the constitution of the reserve: one-fifth of the total reserve amounting to 80 per cent of the initial interest payment (r') is taxed each year at the 10 per cent rate. The equation expresses the tax and dividend payments to the parent company in present value. *N* is the discount rate. The income not benefiting from the incentive is subject to a 35 per cent tax, against which foreign withholding taxes are creditable. For this income, *a* takes into account the part of any withholding tax that exceeds the Dutch tax.

$$\frac{\theta_m}{\theta^*} r' \left[0.2 - (0.2 \times 35\%) - a(w_f - (0.2 \times 35\%) + \sum_{t=1}^{5} \frac{\frac{0.8}{5}(1-10\%)}{(1+N)^t} \right] (1-\alpha\tau_m),$$

where $a = 1$ if $w_f > 0.07$ and $a = 0$ if $w_f \leq 0.07$. After simplification, this gives

$$\frac{\theta_m}{\theta^*} r' \left[0.13 + \sum_{t=1}^{5} \frac{0.144}{(1+N)^t} - a(w_f - 0.07) \right] (1-\alpha\tau_m).$$

Continued overleaf.

Luxemburg Company with a Swiss Finance Branch

The Swiss and Luxemburg tax bases are respectively 17.35 per cent and 5 per cent of the subsidiary's interest payment net of withholding tax, i.e. $r'(1-w_f)$.

To avoid double taxation, Luxemburg allows a credit amounting to 5 per cent of the Swiss tax liability. Hence only 16.5 per cent of the interest payment is liable to the Swiss tax rate (τ_{Switz}). τ_{Lux} is the Luxemburg corporate tax rate.

$$\frac{\theta_m}{\theta^*} r'\left(1-w_f-\left[17.35\%(1-w_f)\tau_{Switz}\right]-\left[5\%(1-w_f)\tau_{Lux}-5\%\times 17.35\%(1-w_f)\tau_{Switz}\right]\right) \times(1-\alpha\tau_m).$$

After simplification, this gives

$$\frac{\theta_m}{\theta^*} r'(1-w_f)(1-0.165\tau_{Switz}-0.05\tau_{Lux})(1-\alpha\tau_m).$$

2. A British Parent Company[34]

BOX A.2

Parent Company's Revenue (third term of financing cost expression): The Case of a British Parent Company

Belgian Co-ordination Centre, IFSC and Luxemburg Company with a Swiss Finance Branch

According to the imputation system and the limitation of the foreign tax credit to the domestic tax, the parent company is liable to the higher of the domestic tax and the foreign tax. For the above-mentioned centres, the combination of the source-country interest withholding tax with the centre's corporate tax does not reach the 33 per cent UK rate, so that the expression only accounts for the home country's corporate tax rate.

$$\frac{\theta_m}{\theta^*} r'(1-\tau_m).$$

[34]The present model considers repatriation of all profits at the end of each year. Hence the CFC legislation is not modelled. However, this provision is likely to affect the structure implied by a Dutch finance company. Such a device would worsen the results, which already make the Dutch finance company fairly unattractive.

Dutch Finance Company

In the Netherlands, that part of profits that does not constitute the reserve is taxed at the 35 per cent rate. Hence an excess credit situation occurs when this income is repatriated to the parent company. For this income, variable *a* accounts for that part of the source country's withholding tax exceeding the Dutch tax. We assume that the reserve is distributed over a period of five years and is liable to a 10 per cent tax in the Netherlands. When repatriating this part of the revenue to the parent company, there is no excess credit but discounting cash flows contributes to reducing the value of the dividend ultimately collected by the parent company.

$$\frac{\theta_m}{\theta^*} r' \left[0.2 - 0.2 \times 35\% - a(w_f - 0.2 \times 35\%) + \sum_{t=1}^{5} \frac{0.16(1-\alpha\tau_m)}{(1+N)^t} \right],$$

where $a = 1$ if $w_f > 0.07$ and $a = 0$ if $w_f \leq 0.07$. After simplification, this gives

$$\frac{\theta_m}{\theta^*} r' \left[0.13 - a(w_f - 0.07) + \sum_{t=1}^{5} \frac{0.16}{(1+N)^t} (1-\alpha\tau_m) \right].$$

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