

The Tax Incentives Applying to US Corporate Investment in Ireland

MAEVE McCUTCHEON*

University College, Cork

Abstract: This paper examines the merits of the 10 per cent manufacturing relief in the context of the Ireland/US tax regime. It measures its value as a tax incentive to US Multinationals by calculating the average effective tax rate. This is the tax rate which applies at a given level of economic rent given the complexity of two tax regimes and a system of double taxation relief. It finds substantial corporate tax incentives, however, these incentives are contingent on a variety of factors outside Irish control which are documented in the paper. The uncertain and fragile nature of the effective tax rate may undermine the value of reduced nominal tax rates as incentives to investment.

I INTRODUCTION

Tax policy in Ireland has worked with the assumption that tax may influence the location of overseas investment by multinational companies. The Irish Corporation tax system has been used to encourage overseas investment and in particular to encourage investment in the manufacturing and financial services sectors, through the application of reduced nominal tax rates. This policy has not been without its costs. In addition to the obvious revenue losses from the application of these reduced nominal tax rates to domestic companies and to international investment which is not tax driven, there is also the potential for distortions arising from the operation of a dual rate system.

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A country playing host to overseas investment does not have control over the ultimate tax burden on that investment, that will depend on the tax system in the home country of the investing company and on the double taxation arrangement between the countries concerned. It is quite conceivable that reduced nominal tax rates simply transfer fiscal revenue from host to home country without any benefit or incentive to the investing company or thereby to the host country.

The objective of this study is to investigate the value of the tax incentives offered by Ireland in an international tax dimension. As a first step it measures the effective tax rates using the King and Fullerton (1984) methodology and compares these to the nominal tax rates. It then examines the impact on the effective tax rates of changes in certain of the parameters, in particular those which are outside domestic control.

Some activities are unlikely to respond to tax incentives when locating their overseas operations, for example activities where market presence is considered to be of overriding importance or activities which are not mobile. This study concentrates on those sectors where tax may be relevant to the investment decision and measures the incentive offered to each sector in the form of reduced effective tax rates. It does not include sectors such as agriculture, mining, construction etc.

The structure of this paper is as follows: Section II outlines the basic methodology; Section III explains the application of the model to the specific circumstances of the Ireland — US tax regime; Section IV presents the effective tax rates; Section V explores the effect of altering certain of the key parameters and Section VI draws some conclusions.

II METHODOLOGY

The King and Fullerton Methodology

An effective Corporate tax rate is a measure of the tax burden on a company which takes account of key features of the tax regime in addition to the nominal tax rate including: the value of Capital Allowances; the treatment of interest payments; the treatment of dividends and capital gains in the hands of investors, etc. However, models which attempt to measure effective tax rates encounter a basic conceptual problem. Once one looks behind nominal tax rates to uncover effective tax rates one must consider factors which are (a) specific to individual companies (b) specific to a particular point in time or (c) specific to a particular tax regime. What one uncovers therefore is an array of potential tax rates for any given tax regime at any given time. In order to make their results more tractable researchers have simplified estimation and averaged the parameters and sometimes the results. These

procedures have led to problems with the interpretation of the results which underlie many of the criticisms levelled at the methodology.

This particular study is conducted in a manner which reduces or avoids many of these pitfalls. There is simplification, for example the range of financing possibilities examined is not exhaustive and only one possible group structure is examined. However, what simplification at this level implies is that the effective tax rates measured are a representative sample from the array of possible rates. Averaging is kept to a minimum and is used only in estimating parameters, e.g., an average asset structure or the average personal tax rate. The results themselves are not averaged as this would mask the dispersion in effective tax rates. As the model used is forward looking, certain of the parameters are estimated e.g., current inflation and current interest rates are used to estimate future rates. However these parameters are themselves subjected to further analysis in Section V.

Which Effective Tax Rate?

Within the King and Fullerton methodology a variety of approaches can be taken to the definition of the tax burden or wedge. In some studies the marginal rate of tax has been measured i.e., the tax rate applying to a marginal unit of investment.¹ The focus of such studies is usually on the effect of tax on the investment decision rather than the location decision. Other studies have looked at the pre-tax return necessary to earn a given post-tax return.² This approach has usually been used for cross-sectional comparison across tax regimes. The focus of this study is international investment which is potentially tax-driven. Therefore it is the location decision rather than the investment decision which is potentially influenced by tax incentives. When we consider tax-driven investment we are considering investment which has significant tax-paying potential. Such investment is usually intramarginal i.e., earning economic rent and for this reason the most appropriate measure of the tax burden is the average tax rate.³ An average effective tax rate in these terms is not the average of a number of marginal tax rates but the average rate applying at a given level of economic rent i.e., it is average in the sense of being intramarginal.

Defining Investment Activity

There are as many types of potential US investment as there are potential US investors. The approach adopted here is to distinguish investment activity

1. See King and Fullerton (1984), Boadway (1985) and Alworth (1988).

2. See Devereux and Pearson (1989) and OECD (1991).

3. While under traditional tax systems the treatment of equity and losses allows marginal investment projects to incur tax liabilities and intra-marginal projects to be tax free, it is more likely that intra-marginal projects would be tax paying.

in accordance with those features which have tax consequences i.e., sector and asset structure. Three principal sectors can be identified for tax purposes, manufacturing, financial and services. Within these broad categories a similar tax regime will apply. Special reliefs do however apply to service and financial activity in certain locations and these reliefs are examined separately.

Five main asset types can be identified which will each have different tax consequences: land; buildings; equipment; inventories, and intangibles i.e., R & D and advertising. It is highly unlikely that an additional unit of investment will be concentrated exclusively in one of these asset types. It is far more likely that investment would involve a combination of different asset types. Use of single asset investment therefore would tend to exaggerate the differences that actually apply in practice between different forms of investment. It is assumed that investment in a particular industry reflects the asset structure which is typical of that industry. In this study the asset structures identified by Fullerton and Lyon for US industry are used.⁴ Eight different industrial groups are examined each of which could involve US investment in this country. i.e., Food, Textiles and Apparel, Paper and Printing, Chemicals and Rubber, Metals and Machinery, Transportation Equipment, Finance and Services.

Timing of the Study

This form of exercise can only be carried out at a single point in time, in this case as at 1 January 1992. A Multinational making investment decisions is concerned with the tax burden over the period of the investment. Therefore there is an implicit assumption that the tax regime is expected to be sustained over the life of the investment. An effective tax rate is an extremely fragile construct depending as it does on a variety of different factors; the domestic tax system, the overseas tax system; the rate of inflation; the real rate of interest, the system of double taxation relief; anti-avoidance legislation etc. At the outset, in this study all these factors are held constant and the current tax environment is taken as the best estimate of the future tax environment. At later stages various aspects of the tax regime and the economic environment are altered to assess their impact on the effective tax rates.

4. Fullerton and Lyon (1987) use a variety of sources to identify the asset structure of US industry by sector distinguishing between Land, Inventories, Research and Development, Advertising, Plant and Machinery and Buildings.

Measuring Effective Tax Rates in an International Setting

The basic model used in this study was developed by King and Fullerton⁵ for the measurement of domestic marginal effective tax rates. The model was adapted by Alworth and the Institute for Fiscal Studies⁶ to deal with International taxation and these adaptations will be used. Although the King and Fullerton framework was designed to deal with marginal investment projects it has also been adapted to the case of projects earning economic rent. In this case what is being measured is an average rather than a marginal tax rate, the average tax rate being defined as:

$$a = \frac{R - R^T}{R} \quad (1)$$

R is economic rent before tax and R^T is economic rent after tax.

Economic rent can be defined as the profit in excess of that required to compensate the providers of capital. This is defined formally as:

$$R = \frac{P + \delta}{\rho + \delta - \pi} - 1 \quad (2)$$

Here P is the gross return, defined without including an allowance for depreciation; ρ is the pre-tax financing cost; π is inflation and δ is the rate of economic depreciation. The first term refers to the discounted value of the gross return and the second term refers to the costs assumed to be one. This may best be conceptualised by considering that Economic Rent is positive where the gross return exceeds the discount factor.

After tax the economic rent must be redefined as

$$R^T = \frac{(P + \delta)(1 - \tau_{ij})}{\rho^T + \delta - \pi} - (1 - A_j \tau_{ij}) \quad (3)$$

In this case gross profit is discounted at an after tax discount rate and costs are reduced by the value of capital allowances and tax incentives. Here A_j is the present value of capital allowances; τ_{ij} is the relevant tax rate and ρ^T is the after tax financing cost. This equation can be usefully considered as consisting of three elements; the first is the nominal tax rate, the second is the present value of capital allowances and the third is the value of the financing subsidy. By substitution of Equations (3) and (2) into Equation (1) the average tax rate a is defined as:

5. See King and Fullerton (1984).

6. See in particular Alworth (1988), and Crooks, *et al.* (1989).

$$a = \tau_{ij} + \frac{\tau_{ij} - A_j \tau_{ij}}{R} + \frac{(1+R)(\rho^T - \rho)(1 - \tau_{ij})}{R(\rho^T + \delta - \pi_i)} \quad (4)$$

The International Dimension

The tax parameters in this model are international tax parameters. Alworth has expanded the basic model by introducing international taxation through two additional parameters τ_{ij} and θ_{ij} . The parameter τ_{ij} is the composite tax rate which depends on the system of corporate tax in both the home and host country and the double taxation arrangement. The parameter θ_{ij} is the opportunity cost of retaining earnings in terms of gross dividends paid to shareholders. This enters into the calculation of the discount rate. In effect the parameter τ_{ij} is the tax levied when income is first earned while θ_{ij} is the additional liability to tax if any when income is remitted.

Financing Strategy

In the absence of a theory of capital structure the traditional approach is to assume that financing is either by debt equity or retained earnings and that each are perfect substitutes. An alternative viewpoint as advanced by Sinn⁷ is that the financing options are mechanisms for arbitraging away the non-neutralities caused by the tax system. Under this assumption the firm will choose whatever financing strategy will minimise its effective tax rate given its existing characteristics, therefore the use of financing strategies will reduce the variation in effective tax rates. Following this assumption, the effective tax rate is measured for a range of financing strategies⁸ and the strategy producing the lowest tax rate is presumed to be chosen. A notable feature of multinational investment is the richness of the financing strategies open to the investing company. Different forms of finance can be raised either by the parent a sister company or the subsidiary and can be transmitted in a variety of ways by the parent to the subsidiary. While it is not possible to capture all of these possibilities, the financing options are modelled as being more complex than a straightforward choice between debt and equity. The financing possibilities examined are those listed in Appendix 1, Table 8.

Corporate Structure

There are three main options facing the US investor as regards corporate structure: establishment of a subsidiary; establishment of a branch of a US parent, or establishment of a branch of a subsidiary located in a third country. Establishment of a branch of a US parent is rarely used as the

7. Sinn (1990).

8. It is assumed that the subsidiary would not have sufficient retained earnings to finance the investment.

benefits of 10 per cent manufacturing relief would be lost. Establishment of a branch of a subsidiary located in a third country such as Holland or Bermuda is a popular option. The underlying reasoning for this form of corporate structure is to retain the 10 per cent manufacturing relief while obtaining more favourable tax treatment for income from financial investments. However, this study is concerned only with how the tax system bears on the primary investment decision and it is assumed that all investment is by means of a wholly owned subsidiary of a US resident parent.

Economic Rent

The average rate of tax may be sensitive to the assumption made about the level of economic rent. As the level of rent increases the relative importance of capital allowances diminishes. For this reason a range of values for economic rent have been selected. It is likely that the economic rent originates largely in the parent company. If the economic rent were location specific then the need for tax incentives would be questionable. It is assumed that the rent can be attributed to the subsidiary although for mobile investment it is more likely to be source based than residence based. This assumption is explored further in Section V.

III THE IRELAND-US TAX REGIME

The Double Taxation Agreement

For subsidiaries, the double taxation agreement between Ireland and the US provides for a system of credit with deferral. In principle this means that companies will be first taxed according to the Irish corporate tax regime and will then get credit against their US tax liability for the Irish tax paid. However, liability to US tax will only arise when profits are repatriated.

An averaging provision applies whereby the US tax authorities group together all the overseas tax paid within a group and give credit only where the average rate of tax is below the US rate. Therefore, a US investor with no other subsidiaries abroad will be first taxed at a nominal rate of 10 per cent in this country and if profits are repatriated will pay US federal tax at 34 per cent with credit given for the Irish tax paid. However, an investor with subsidiaries located in a high tax jurisdiction could have tax liabilities which it was previously unable to relieve against its US federal tax. These are what is known as excess credits. If it establishes a subsidiary in Ireland it will first pay tax at a nominal rate of 10 per cent. The excess credits generated elsewhere could reduce its potential liability to US tax on repatriation. In the most favourable possible outcome no additional tax will be paid on repatriation.

The effect of the averaging provision is to make the tax potentially payable on repatriation sensitive to the overall group structure i.e., the location of group companies worldwide. Excess credits can be used in the Irish context either to reduce the tax potentially payable on repatriation for companies paying at 10 per cent, or to gain a tax benefit on repatriation for companies paying at 40 per cent. In this study it will be assumed that either the company can make no use of the averaging provision or that it can make full use of the averaging provision. The results obtained show boundary positions between which companies with some excess credits but not sufficient to remove all additional liabilities will fall.

Exceptions to the Double Taxation Arrangements

The principle exceptions to the arrangements described above relate to Subpart F Income, Intercompany loans, Apportionment of Interest and Financial Service Income.

(a) Subpart F

Deferral of US tax liability does not apply to investment income, income from sales to affiliates and income from services performed for affiliates. As discussed above, this study concentrates only on the first stage investment decision. It is also assumed that there are no inter-group sales.

(b) Intercompany Loans

Parent company borrowing may be transmitted to the subsidiary either in the form of debt or in the form of equity. If transmitted as debt there is a clear incentive for transfer-pricing abuses due to the wide difference in nominal tax rates between the US and here. However for the purposes of US tax interest income is imputed to the lender at arms-length rate. For this reason it is assumed that there is arms-length pricing of inter-company loans.

(c) Apportionment of Interest Income

Another method of exploiting the difference in nominal tax rates is for leveraged US companies to fund the subsidiary with instruments which classify as equity. This gives rise to the phenomenon of "thick capitalisation". Special rules apply in the US to restrict this phenomenon. Broadly it requires the interest expense of the parent company to be allocated to the subsidiaries for the purpose of determining whether the income is foreign source or domestic source thus reducing the amount of income to be taxed at the lower rate. In order to approximate the effects of this restriction it is assumed it is not possible to make use of excess credits where the parent raises debt to fund the subsidiary. This assumption is relaxed at a subsequent stage in the analysis.

(d) Financial Services

Financial service income comes within a separate category for the purpose of calculating the overall foreign tax credit. In practice this means that it is not possible to mix low-tax financial service income with high-tax manufacturing income for the purpose of recouping excess tax credits. Therefore, the assumption of excess tax credits in the case of financial service income involves the more restrictive assumption of excess tax credits arising on financial service income.

Features of the Irish Tax System

Manufacturing relief is available only on the proportion of a company's profits arising from the sale of manufactured goods. Therefore not all profits within the manufacturing categories necessarily qualify. Furthermore, certain service activities qualify for manufacturing relief e.g., certain design and planning activities, software development etc. In this study it is assumed that a nominal rate of 10 per cent applies to all manufacturing activity and that a rate of 40 per cent applies to all service activity outside the financial services centre.

Capital allowances apply in general to industrial buildings and plant and machinery. At 1 January 1992 when this study was conducted a range of different rates applied within the broad category of plant and machinery. In this study all plant and machinery is assumed to be given allowances at a rate of 12.5 per cent. The standard rate of capital allowance for industrial buildings is 4 per cent on a straight line basis. Allowances of 100 per cent are available for industrial buildings and plant and machinery within the Custom House docks area and allowances of up to 100 per cent are also available for commercial buildings in designated areas. These additional incentives are also examined within this analysis.

A further method by which the differences in nominal tax rates can be exploited is to engage in what is known as Section 84 lending. This practice exploits the difference in domestic tax rates by treating debt as quasi equity and thus transferring the tax relief to a company, usually financial, paying at 40 per cent. The extent to which the net tax advantage is passed from lender to borrower is unclear. One approach as adopted by Flynn and Honohan⁹ is to assume as a lower bound that all the benefit is passed to the borrower. However, both in view of this uncertainty and taking account of the restrictions on Section 84 lending the main part of the analysis is conducted on the assumption of no Section 84 lending, and the effects of Section 84 lending are dealt with as a separate issue.

9. See Flynn and Honohan (1982).

IV THE EFFECTIVE TAX RATES AT 1 JANUARY 1992

The Effective Average Rate of Tax

Table 1 below shows the average rates of tax for overseas corporations on projects earning economic rent of 10 per cent. What is immediately apparent is that the effective rate of tax is below the nominal rate in all cases and in the case of manufacturing companies which can exploit excess credits, the effective rate is negative which indicates that such companies have effectively been subsidised. Two questions arise. First, why is the effective rate below the nominal rate and second, who is bearing the cost of the revenue foregone?

Table 1: *Average Effective Tax Rates 10 Per Cent Rent*

<i>Sector</i>	<i>Nominal Rate</i>	<i>Excess Credits</i>	<i>No Credits</i>
	%	%	%
Chemicals	10	-4.9	3.7
Finance FSC ^a	10	-6.0	3.3
Food	10	-5.2	3.6
Machinery	10	-8.2	2.4
Printing	10	-7.9	2.5
Textiles	10	-9.8	1.8
Transport Equipment	10	-5.8	3.2
Finance General	40	18.4	18.4
Services General	40	18.2	18.2

^aFinancial Services Centre.

In terms of Equation (4), there are two main ways in which the tax system could achieve effective tax rates which equal the domestic nominal rate. First, if full capital allowances are given, i.e., with a present value of 1, but no allowance is given for funding costs then effective tax rates equal the nominal tax rate. The alternative is to give capital allowances at the rate of economic depreciation, i.e., tax depreciation d becomes δ , and allow tax relief on the real as opposed to the nominal cost of funds. In each case there would be a further requirement in the international context that no additional tax is borne on repatriation of profits. Given the stringency of these conditions traditional tax systems would not be expected to equate nominal with effective tax rates.

As the effective tax rates are below the nominal tax rates this suggests that either the system of capital allowances is "generous", i.e., exceeds the true rate of depreciation, or the relief available for financing is "generous".

The System of Capital Allowances

Table 2 below shows the effective tax rates which would apply under the current system of capital allowances if the tax relief on financing costs were

restricted to the real cost of funds. In the case of manufacturing companies the effective tax rate comes close to the nominal tax rate once the financing subsidy is removed. This implies that the system of capital allowances which applied at that stage 12.5 per cent for plant and machinery, 4 per cent for industrial buildings etc., was not far from the assumed rate of economic depreciation for the assets as a whole. Of course, this represents an average across the asset types and masks the fact that in certain circumstances the rate of economic depreciation exceeds the rate of allowance e.g., commercial buildings, while the reverse holds true in other cases.

Table 2: *Average Tax Rates: Relief for Real Financing Costs Only*

	<i>Only Real Financing Costs</i>	<i>Nominal Rate</i>
	%	%
Chemicals	7.3	10
Finance FSC	7.2	10
Food	7.4	10
Machinery	6.7	10
Printing	6.8	10
Textiles	6.5	10
Transport Equipment	7.0	10
Finance General	33.2	40
Services General	32.7	40

The Tax Treatment of Financing Costs

There are a variety of ways in which tax systems can "overcompensate" for the cost of funds.

(a) *Relief for Nominal Funding Costs*

Traditional tax systems grant relief for the nominal rather than the real cost of funds. This apparent subsidy is mitigated by the failure of tax systems to give stock relief or to index capital allowances. In this analysis companies paying tax at 40 per cent would finance their subsidiaries through local borrowing. With expected inflation at 4.3 per cent this reduces their after-tax cost of funding from the 7.3 per cent which would apply if the only real financing costs applied to 5.6 per cent. Companies paying tax at 10 per cent without excess credits would also opt for local borrowing but the relief available is much less. The cost of funds is reduced to 8.4 per cent rather than the 8.8 per cent which should apply in theory. Further reductions in the cost of funding are achieved through the tax treatment of exchange rate gains following which the funding costs become 5.3 per cent and 8.2 per cent respectively.

(b) Favourable Tax Treatment of Capital Gains

Favourable tax treatment of capital gains in the hands of the ultimate investor can reduce the cost of funds for investments financed by retained earnings. However this requires the repatriation of profits by the subsidiary. In this analysis retained earnings are an attractive option only in the case of companies paying tax at a nominal rate of 10 per cent and able to repatriate profits without penalty due to the existence of excess credits. In this case the cost of funds is 7.2 per cent rather than the 8.8 per cent which should apply in theory.

(c) Exploitation of Differences in Tax Rates

A US company operating through a subsidiary in this country can potentially exploit either the differences in nominal tax rates between the US and this country, 10 per cent or 34 per cent, and the differences in nominal rates within this country, 10 per cent and 40 per cent. The former route would involve parent company borrowing and transmission of the funds to the subsidiary using either transfer pricing or equity instruments. This must be done in a manner which ensures that profits are still taxed at 10 per cent while relief is obtained at 34 per cent. In the analysis above it was assumed that under the apportionment of interest rules such opportunities are effectively closed.

One of the methods by which the domestic tax rate differences can be exploited is Section 84 lending which is described above. If it is assumed that the borrowing company takes all the net advantage from Section 84 lending then the after tax cost of funds is reduced to 6.1 per cent compared to a theoretically correct cost of 8.8 per cent.

The table below shows the effective tax rates which could be achieved by manufacturing companies either through exploiting relief at the 34 per cent rate or the 40 per cent rate. These should be interpreted with caution as in the case of the parent company borrowing the US rules may effectively outlaw such arrangements, while in the case of Section 84 lending in addition to current restrictions the extent to which the tax advantage is passed back to the borrower is not clear. It is worth noting that the US bears the cost of relief generated by parent company borrowing while this country bears the cost of Section 84 lending.

Investment Incentives

Certain additional capital incentives apply to capital investment in service activities within designated areas and to the financial services centre. The effect of these incentives on the average effective tax rate is shown below at Table 4. Broadly speaking these incentives involve accelerated capital

Table 3: *Effective Tax Rate with Additional Financing Options*

	<i>Basic Assumptions</i> %	<i>Parent Borrowing</i> %	<i>Section 84 Lending</i> %
Chemicals	-4.9	-18.5	-15.5
Finance FSC	-6.0	-21.0	-17.7
Food	-5.2	-19.3	-16.1
Machinery	-8.2	-25.6	-21.6
Printing	-7.9	-25.1	-21.2
Textiles	-9.8	-29.5	-24.9
Transport Equipment	-5.8	-20.2	-17.0

Table 4: *Average Tax Rates Under Various Capital Incentive Schemes*

	<i>Current System</i> %	<i>Nominal Tax Rate</i> %
Finance FSC	3.3	10
Finance General	18.4	40
Finance Rural D.A.*	17.6	40
Finance Urban D.A.	18.0	40
Services General	18.2	40
Services Rural D.A.	16.5	40
Services Urban D.A.	17.4	40

*D.A. refers to designated areas.

allowances for buildings and/or plant and machinery and in the case of the financial services centre a reduced nominal tax rate of 10 per cent.

The study used the asset structures identified for Fullerton and Lyon (1987) for US investment. This assumes that the asset structure of overseas US investment is broadly similar to that of US domestic investment within the sectors studied. In fact the study by Henry¹⁰ for Irish industry identified asset structures which were broadly similar to the Fullerton and Lyon study. The main concern is in the Financial Services area where Fullerton and Lyon had found substantial investment in land amounting to 55 per cent of total investment. As it may be unreasonable to assume that overseas investors who are tax driven would invest in land, the analysis has also been conducted without any such investment and the results are shown in Appendix 2.

10. Henry (1989) produces estimates of gross investment in some of the asset types for comparable industrial groupings. These are not markedly dissimilar from the Fullerton and Lyon estimates except for the Financial Sector.

V THE ROBUSTNESS OF THE EFFECTIVE TAX RATES

The measurement and analysis of effective tax rates above has shown that for companies earning economic rent of 10 per cent the effective tax rates under the tax regime applying on 1 January 1992 were substantially below the nominal rates. Furthermore it revealed that these reductions were largely due to the favourable tax treatment enjoyed by various forms of financing under the Ireland/US tax regime. These results depend on assumptions about the continuity of that tax regime both the domestic components and the Double taxation arrangement. They also depend on key features of the economic environment notably inflation and interest rates which impact on the value of the financing subsidies and also on the present value of Capital Allowances. In this section the effects on the results of certain elements of the tax regime and of the economic environment, which can be considered to be outside domestic control are investigated.

Changes to the Tax Regime

(a) Deferral

The table below shows the effects of the removal of deferral. This effectively results in profits being taxed at the US rate as they arise where the US rate is below the Domestic rate. The question of excess credits no longer arises as there is no additional liability to tax on repatriation. As can be seen from this table, the 10 per cent rate offers little additional incentive over the 40 per cent rate without deferral a result which is hardly surprising. Therefore the continued value of the 10 per cent rate depends critically on the continuing expectation of the maintenance of deferral.

Table 5: *Effective Tax Rates Without Deferral*

<i>Sector</i>	<i>No Deferral</i> %	<i>Nominal Rate</i> %
Chemicals	17.7	10
Finance FSC	16.4	10
Food	17.5	10
Machinery	12.2	10
Printing	12.7	10
Textiles	9.3	10
Transport Equipment	16.0	10
Finance General	18.4	40
Services General	18.2	40

(b) Averaging

A further important feature of the Ireland/US regime is the averaging arrangement i.e., the ability of companies to combine the profits of subsidiaries in different tax jurisdictions to determine the tax potentially payable on repatriation. Table 1 shows the importance of this provision negative tax rates only arose where full use could be made of the averaging provision in order to repatriate profits taxed at 10 per cent without additional tax penalties. This provision allowed companies to fund their Irish subsidiaries through profits retained by the parent while the best option available in its absence is local borrowing. The 10 per cent manufacturing rate still provides a substantial incentive in the absence of the averaging provision i.e., a reduction in effective tax rates from 18 per cent to the region of 3 per cent but its value is significantly enhanced where companies can make use of averaging.

(c) The Treatment of Capital Gains

The averaging provision is a necessary but not a sufficient condition for the emergence of the effective tax rates shown in Table 1. This also requires the continuing existence of a more favourable regime for Capital Gains than for income. Changes to this regime could also alter the relative attractiveness of borrowing and retained earnings as sources of finance and increase the effective tax rates to the region of 3 per cent.

(d) Apportionment of Economic Rent

It is assumed in the analysis in Section IV that the subsidiaries can earn economic rent of 10 per cent and that this rent is attributed to them in apportioning profits between parent and subsidiary. This appears to be a logical assumption as the value of a tax incentive depends in the first instance on the existence of profits which can benefit from the reduced tax rate. There is a problem here however which is that if the rent arises in the subsidiary e.g., through the quality of the workforce or the strategic location etc., it begs the question why the tax incentive is necessary in the first instance. One possibility is that rent attributed to the subsidiary is not location specific and could therefore from another perspective be attributed to the parent. It is worth examining the situation where the economic rent is apportioned to the parent. In this case the projects become marginal projects. Table 6 below shows the tax position of marginal projects under the parameters outlined. In this case what is shown is the pre-tax return necessary to earn a post-tax return of 5 per cent. It can be seen that in all cases other than the general financial sector the tax regime subsidises marginal projects to some extent. However, the value of a tax incentive for

attracting mobile overseas investment depends on the ability to claim profits at the subsidised rate. Therefore, it also depends on the overall level of economic rent which can be attributed to the subsidiary.

Table 6: *Marginal Tax Rates*

<i>Pre-Tax Return Necessary to Earn a 5 per cent Post-Tax Return</i>		
<i>Sector</i>	<i>Excess Credits</i> %	<i>No Credits</i> %
Chemicals	3.5	4.7
Finance FSC	3.7	4.8
Food	3.6	4.8
Machinery	3.5	4.7
Printing	3.5	4.7
Textiles	3.6	4.7
Transport Equipment	3.4	4.5
Finance General	6.0	6.0
Services General	4.8	4.8

The analysis above has been conducted for companies earning economic rent of 10 per cent. However, the result is relatively insensitive to the assumed level of economic rent. Table 10 in Appendix 3 shows the average tax rate at various levels of economic rent.

The Economic Environment: Inflation

A major element in the financing subsidy is the ability to treat the nominal element in interest costs as an expense for tax expenses. As a result the effective tax rate is sensitive to the level of inflation. Inflation will also affect

Table 7: *Effective Tax Rates at Various Inflation Rates*

<i>Inflation Rate</i>	<i>0%</i>	<i>2%</i>	<i>4.3%</i>	<i>10%</i>
	%	%	%	%
Chemicals	6.6	5.3	3.7	0.1
Finance FSC	6.6	5.1	3.3	-0.7
Food	6.7	5.3	3.6	-0.1
Machinery	6.0	4.3	2.4	-2.1
Printing	6.0	4.4	2.5	-1.8
Textiles	5.7	3.9	1.8	-3.1
Transport Equipment	6.4	4.9	3.2	-0.6
Finance General	33.8	29.0	18.4	1.6
Services General	32.9	28.3	18.2	2.3

the present value of capital allowances, which are not indexed for inflation. Table 7 shows the effects on the effective tax rate of varying assumptions about the level of inflation at a given real interest rate.¹¹

VI CONCLUSIONS

This study set out to find whether the tax regime existing which applied in January 1992 to US multinational companies operating in Ireland provided tax incentives in the form of low effective tax rates. The study found that, for manufacturing and some financial activities, low and in some cases negative effective tax rates applied, while for other activities the effective tax rates were generally below the nominal rate of 40 per cent.

The Role of Financing Opportunities

Transnational investors have a rich menu of investment alternatives. By using these financing alternatives to exploit differences in tax regimes negative tax rates can arise. Three options are considered in this analysis. First, for companies with excess credits available elsewhere in the Group there is the opportunity to use earnings retained by the parent to finance the overseas operation. For this to be effective the parent company must have operations in a high-tax overseas jurisdiction. It also implies that a favourable tax regime for capital gains is expected to be maintained in the US. Second, there is the possibility of exploiting the differences between the US and Irish corporate tax rates by funding the subsidiary through parent company borrowing, transmitted either by an equity style instrument or by low cost lending. Such devices are severely limited by US rules on the apportionment of interest. Finally there is Section 84 lending. If the assumption holds, that all the benefit of such lending is passed to the borrower such instruments would involve much reduced effective tax rates though admittedly with the cost being borne domestically.

Capital Allowances

The system of capital allowances which operated at that period was not very different from a theoretically "correct" system which gives allowances approximating to economic depreciation. The various special allowances and reliefs in designated areas were reflected in reduced effective tax rates but the reductions which were achieved were modest.

11. The analysis does not fully capture the extent of the effects of inflation on effective tax rates due to the omission of elements such as stock costs.

How Robust are the Effective Tax Rates?

It is not current effective tax rates which can influence investment decisions but expected future rates. It is not sufficient to establish that low effective tax rates existed, they must also have been expected to be maintained. For this reason the factors which brought about the low effective tax rates are of particular importance. Therefore, the robustness of the effective tax rates given certain plausible changes in the underlying parameters was examined.

Inflation

The low level of effective tax rates in this study arose largely from the reductions in financing costs. For companies paying tax at 40 per cent and also some companies paying at 10 per cent the reduction in financing costs is achieved largely through tax relief on the nominal as opposed to the real cost of funds. The benefit of the relief depends on the assumed level of inflation. Even at relatively modest levels of inflation and relatively high real interest rates, 4.3 per cent and 5 per cent respectively the effect of this relief is substantial.¹² As the level of inflation is increased the effective tax rate falls especially for those companies paying tax at 40 per cent however these results need to be interpreted with caution as the model is imperfect in its treatment of inflation.

Features of the US Tax Regime

The effective tax rates were constructed under the basic assumption that a system of credit *with deferral* is expected to be maintained over the life of the project. Deferral allows the analysis to work from a nominal tax rate of 10 per cent in the case of manufacturing and some service activities rather than from the US Corporate rate of 34 per cent. This is a critical assumption. The 10 per cent manufacturing relief is of little value without the system of deferral as the effective tax rate is not significantly lowered by the relief. Revenue is simply transferred to the home country tax authorities.

In addition it was also assumed that the economic rent on such projects can be ascribed to the subsidiary rather than the parent. Tax incentives would have little relevance if there were no profits in the subsidiary to tax and if such profits arose from the location of the investment then the need for tax incentives in the first place would be questionable. Therefore, the value of the 10 per cent tax rate as an incentive depends critically on this assumption. Although it is shown that a marginal overseas investment would be subsidised under the regime then operating, the value of such subsidy is

12. It should be noted that the downside for companies of a historical cost definition of the tax base has not been taken into account in the analysis.

questionable without the ability to ascribe profits to the subsidiary.

The negative tax rates calculated in this study arose from a combination of the exploitation of the Averaging provision and a more favourable tax regime in the US for capital gains than for income. If either of these factors were changed the negative rates disappear and the effective rate of tax is positive and in the region of 3 per cent.

The Manufacturing relief which reduces the nominal rate of tax from 40 per cent to 10 per cent did result in a considerable reduction in the effective tax rate which applied to US companies in January 1992. However, the value of such reductions in effective tax rates as incentives is open to question as they are dependent on a variety of factors which are volatile and/or outside the control of the Irish Authorities i.e., inflation, the US tax regime, anti-avoidance legislation, the disposition of US overseas investment etc. Any one of a variety of changes could undermine the value of the relief. Given that it is future rather than current tax rates which are assumed to be relevant in investment decisions these uncertainties must undermine the value of the tax reliefs as incentives especially for projects with a medium to long time horizon.

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APPENDIX 1

Data Sources

The model used in this study can be summarised by the following equation

$$a = \tau_{ij} + \frac{\tau_{ij} - A_j \tau_{ij}}{R} + \frac{(1+R)(\rho^T - \rho)(1 - \tau_{ij})}{R(\rho^T + \delta - \pi_i)} \quad (4)$$

which is derived by the definition of the average rate of tax as

$$a = \frac{R - R^T}{R}$$

Taking each element of the model in turn the data required are as follows:

- τ_{ij} This is the composite corporation tax rate. In the case of a system of credit with deferral the relevant tax rate is the tax rate in the host country.
- A This represents the present value of capital allowances. This can be represented formally as:

$$A = d \frac{(1 + \rho^\tau)}{\rho^\tau} \left(1 - \frac{1}{(\rho^\tau + 1)^t} \right) \quad (5)$$

where d is the rate at which depreciation allowances are given for tax purposes and t is the period of time for which they are given. Where capital allowances are given on a reducing balance basis they are defined as

$$A = \frac{d(1 + \rho^\tau)}{(\rho^\tau + d)} \quad (6)$$

- R In this case R is assumed to take a range of values as discussed above.
- ρ^T This is the after tax discount rate and will depend on the method of financing used. As discussed above it is assumed that the least-cost financing method is used (see the table of possible financing methods below). This will vary depending on the rate of corporation tax τ_{ij} and the cost of repatriating dividends θ_{ij} .

- ρ_i This is the discount rate before tax in the home country and is simply the nominal rate of interest.
- δ This is the true rate of economic depreciation and will differ for each asset type. In this analysis the rates of economic depreciation used by Hulten and Wykoff¹³ are used.
- π_i This is the anticipated rate of inflation in the home country. This study is conducted as at 1 January 1992 and the inflation rate for 1991 is used.

A critical element in this analysis is the measurement of the post-tax discount rate under various financing strategies and the selection of the cost minimising strategy for each case. Table 8 below formalises the financing strategies available to the US parent of a wholly owned subsidiary operating in Ireland.¹⁴ In this study it is assumed that the strategy producing the lowest after tax discount rate is chosen.

Table 8: *Definition of Financing Strategies*

<i>Method of Financing</i>	<i>Cost of Capital ρ^T</i>	
1. Borrowing by Subsidiary	$i(1 - \tau_{ij})$	(7)
2. Borrowing by parent with lending or new share issue to Subsidiary	$\frac{i\theta_j(1 - \tau_i)}{\theta_{ij}}$	(8)
3. Share issue by parent with lending to affiliate	$\frac{i}{\theta_{ij}}$	(9)
4. Share issue by parent purchase of shares in subsidiary	$\frac{i(1 - m_b)}{\theta_{ij}(1 - m_s)}$	(10)
5. Retention by parent with purchase of shares or lending to subsidiary	$\frac{i(1 - m_b)}{(\theta_{ij} - \theta_j) + (1 - z)}$	(11)

The additional data required to measure the after-tax cost of finance is described below.

- m_b This is the rate of personal tax on interest income in the US. This parameter is obtained from the recent OECD study.¹⁵

13. Hulten and Wykoff (1981). These rates of economic depreciation have been used in all of the studies cited above.

14. Taken from Alworth (1988).

15. OECD (1991).

- m_s This is the rate of personal tax on dividend receipts. In principle the rate is the same as that for interest receipts but different ownership weighting may result in a different effective rate of tax. Again this is obtained from the recent OECD study.
- z This is the rate of capital gains tax. Capital gains are taxed as they are realized rather than as they accrue. The benefit to the taxpayer of realization has been modelled by King and Fullerton as follows:

Let z_s be the nominal rate of capital gains tax

Let z be the effective rate of capital gains tax

$$z = \frac{\lambda s_s}{\lambda + \rho_\tau} \quad (12)$$

where ρ is the discount rate and λ is the proportion of capital gains that are realized in each period.

For any given combination of sector, asset structure or asset category the financing option resulting in the lowest after-tax cost of capital will be presumed to be chosen.

APPENDIX 2

The table below shows the effect of omission of land from the asset structure. The effect is calculated under the assumption of full use of excess credits and under the assumption of no credits being available. Apart from the effects in the Financial Services Centre the omission of land has little effect on the results.

Table 9: *Effect of Omission of Land from Asset Structure*

	<i>Excess Credits</i>		<i>No Excess Credits</i>	
	<i>Land</i> %	<i>No Land</i> %	<i>Land</i> %	<i>No Land</i> %
Chemicals	-4.9	-4.1	3.7	3.9
Finance FSC	-6.0	-0.5	3.3	5.6
Food	-5.2	-4.0	3.6	4.1
Machinery	-8.2	-7.2	2.4	2.7
Printing	-7.9	-6.3	2.5	3.1
Textiles	-9.8	-8.3	1.8	2.3
Transport Equipment	-5.8	-5.3	3.2	3.4
Finance General	18.4	30.2	18.4	30.2
Services General	18.2	19.4	18.2	19.4

APPENDIX 3

Table 10: *The Effect of Rent on Average Tax Rates*

	<i>Excess Credits</i>		<i>No Excess Credits</i>	
	<i>Rent 10%</i>	<i>Rent ∞</i>	<i>Rent 10%</i>	<i>Rent ∞</i>
Chemicals	-4.9	-3.5	3.7	4.0
Finance FSC	-6.0	-4.8	3.3	3.5
Food	-5.2	-3.9	3.6	3.8
Machinery	-8.2	-6.7	2.4	2.7
Printing	-7.9	-6.5	2.5	2.8
Textiles	-9.8	-8.4	1.8	2.0
Transport Equipment	-5.8	-4.3	3.2	3.7
Finance General	18.4	17.7	18.4	17.7
Services General	18.2	18.3	18.2	18.3

An increase in the level of economic rent has two offsetting effects on the effective tax rate. First, the burden of incomplete capital allowances diminishes and second, the importance of the financing subsidy also diminishes. These effects tend to offset each other and in general changes in the level of rent have little effect.