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The Rate of Return on New Investment in the UK

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WHILE IT IS FREQUENTLY asserted that British industry has earned an inadequate return on investment, there has been little agreement among economists as to what exactly this rate has been in recent years. This note provides striking new evidence that the profitability of British industry is currently much lower than anyone had previously supposed.

To understand our reasoning, it is important to note two features of the British tax system. First, companies are allowed to write off immediately the full amount of any investment in plant and equipment. Second, corporate taxes are paid with a delay of approximately one year. Suppose a company makes an investment today of C_0. This investment generates a tax shield in year 1 of TC_0, where T is the corporate tax rate. Beginning in year 1 the company receives a cash inflow of C_t, $t = 1$ to N. On each of these cash inflows the company pays tax at a rate of T with a delay of one year. Thus gathering together these cash flows and denoting inflows as positive and outflows as negative, we find the following pattern of cash flows on any project:

Period	0	1	2	...	N	$N+1$
Investment	$-C_0$					
Depreciation tax shield		$+TC_0$				
Gross income		$+C_1$	$+C_2$	...	$+C_N$	
Tax on income			$-TC_1$	...	$-TC_{N-1}$	$-TC_N$
Total	$-C_0$	$+TC_0+C_1$	$-TC_1+C_2$	...	$-TC_{N-1}+C_N$	$-TC_N$

Such a project has zero net present value when the discount factor $= 1/T$.

$$NPV = -C_0 + \frac{TC_0}{T} + \frac{C_1}{T} - \frac{TC_1}{T^2} \cdots + \frac{C_N}{T^{N-1}} - \frac{TC_N}{T^N} = 0$$

Thus the internal rate of return on such an investment is $(T - 1)$. Since the corporate tax rate (T) is 52 percent, we deduce that British industry has been investing at a return of $T - 1 = -48$ percent after tax.[1]

Notice what a powerful result this is. By providing an analytical solution to the rate of return on company investment, we have avoided all the pitfalls of empirical estimation. Furthermore, we have shown that not only is minus 48 percent the

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[1] The government also provides cash grants for investment in designated development areas. The effect of these grants is generally to reduce the internal rate of return even further. It is no wonder that these policies have been ineffective in attracting investment to these areas.

average return on new investment, but it is the return on virtually every new project by every British company.[2] It is equally true of both positive and negative net present value projects: a point which emphasises quite dramatically just how misleading net present value can be.

We believe that this astoundingly low rate of return on investment is the root of the poor performance of the British economy in recent years.[3] The responsibility for this result is clearly the British government's. The 100 percent first year allowance was introduced in an attempt to stimulate capital investment. Had the Chancellor of the Exchequer taken the trouble to glance at any textbook on capital budgeting, he could scarcely have failed to notice the cost of such a measure.

We hope that our research will lead to a better understanding of the poor performance of the British economy but we are not optimistic. We understand that there are proposals to reduce the tax delay to 3 months. This change must be resisted at all costs. It would reduce the return on new investment to a staggering minus 93 percent.

[2] It is interesting to notice that many tax-free companies lease their equipment from taxable companies. Since the taxable company is earning a return of minus 48 percent on any equipment that it buys it would make better economic sense if the tax-free company was the lessor and the taxable company was the lessee. It is a sad reflection on British financial institutions that they have not recognised this fact.

[3] Some of our colleagues have even described it as the multiple root of our problems.