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After the Super-Deduction

Assessing Proposals for the Reform of Capital Allowances

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Key Findings

- For many years, the UK has adopted a strikingly ungenerous approach to *capital cost recovery* – the ability of firms to write off investment against tax. This has coincided with consistently low levels of business investment.

- The government has considered making the system of capital allowances more supportive of investment and published a number of reform options in March's Spring Statement.

- Based on our original economic modelling, each of the reform options outlined by the Treasury would reduce marginal effective tax rates on new investment and boost investment, wages, and economic growth.

- Their most ambitious option – a watered-down version of full expensing for plant and machinery – would have the greatest impact, increasing long-run GDP by 0.7 percent.

- Going beyond the Treasury's initial suggestions by extending genuine full expensing to structures and buildings would more than triple the economic impact of capital allowance reform, boosting long-run GDP by 2.5 percent.

- The government should be as bold as possible when it comes to permanent reform of capital allowances. High up-front revenue losses should not necessarily be prohibitive, given their transitory nature, and can be reduced using an approach known as neutral cost recovery.

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Introduction

With the Conservative leadership election over and Liz Truss appointed Prime Minister, it is clear that the headline rate of corporation tax will remain at 19 percent. This is good news for the British economy. Corporate income taxes are the most damaging type of tax when it comes to GDP per capita.[1] All things being equal, raising corporation tax would have depressed investment, wages, and economic growth.

However, simply maintaining the status quo on corporation tax will not in itself do much to *increase* the UK's growth prospects. What's more, the headline rate was only one part of the corporate tax cliff edge that the UK faced come April 2023. The super-deduction, which has temporarily made the UK tax system much more supportive of capital investment in plant and machinery, is also set to expire.

In the absence of the super-deduction, the UK's broader system of capital allowances is strikingly ungenerous by international standards. This creates a significant tax bias against business investment. Indeed, the Tax Foundation's 2021 International Tax Competitiveness Index ranked the UK 33rd out of 37 OECD countries for 'capital cost recovery' – a measure of how well a corporate tax system treats investment. This is one of the most significant ways that the tax system weighs on growth.[2]

Former chancellor Rishi Sunak outlined several options for reforming capital allowances in the Spring Statement.[3] These options would increase the writing down rate for plant and machinery in various ways. While the overall fiscal picture has changed since the spring, the new chancellor ought to carefully consider implementing some version of his predecessor's proposed reforms – or even a more ambitious option with a greater potential to boost growth.

This paper compares the growth impacts and fiscal costs of different models of capital allowance reform. Its analysis stems from an economic model (see Appendix) designed to estimate the effect of different capital allowance regimes on long-run GDP, investment, and wages. Unsurprisingly, the closer we get to 'full expensing' of all investment – when costs of investments are immediately deducted – the greater the economic gains. But as we will show, even more incremental changes can have a meaningful, positive impact.

The government has several options to improve policy relative to the baseline. However, one key element to a successful reform is *permanency*. Short-term measures might provide temporary incentives for investment, but they also complicate things over the long term and miss an opportunity for creating certainty for businesses. Lasting reform will have a pronounced and sustainable impact on jobs, wages, and long-run economic growth.

1 Asa Johansson et al., "Tax and Economic Growth", OECD, Jul. 11, 2008, https://www.oecd.org/tax/tax-policy/41000592.pdf.

2 Daniel Bunn and Elke Asen, "International Tax Competitiveness Index 2021," Tax Foundation, Oct. 18, 2021, https://taxfoundation.org/publications/international-tax-competitiveness-index.

3 HM Treasury, "Spring Statement 2022," Mar. 23, 2022, https://www.gov.uk/government/publications/spring-statement-2022-documents/spring-statement-2022-html; HM Treasury, "Potential Reforms to UK's Capital Allowance Regime – Inviting views," May 9, 2022, https://www.gov.uk/government/publications/potential-reforms-to-uks-capital-allowance-regime-inviting-views/potential-reforms-to-uks-capital-allowance-regime-inviting-views.

Background

Capital investment is critical to long-term economic growth. It will also be particularly important as countries seek to develop and implement new technologies as part of the transition to Net Zero.[4] As things stand, however, tax systems often create barriers to investment in new machinery, buildings, and other fixed assets.

Those barriers come about because investment costs are treated differently by the tax system than day-to-day business costs. Instead of deducting capital expenditure immediately, firms usually have to write it off against their tax bills over time, in line with various capital allowances or depreciation schedules.

The problem is that the more you spread out the tax deduction for capital investment, the less valuable it becomes. Once you factor in inflation – a huge issue at the moment – and the time value of money, businesses end up recovering far less than the full cost of their initial investment. This embeds a structural distortion within the corporation tax system that reduces the return to capital and ultimately discourages business investment. This distortion is particularly pronounced when inflation is high.

Most tax systems around the world contain this flaw. Yet as noted above, the United Kingdom has consistently ranked poorly on international comparisons of how countries treat capital investment. A 2021 Tax Foundation report, which looked at data from before the introduction of the super-deduction, found that for structures, plant and machinery, and intangible assets, the UK only allowed businesses the ability to deduct 61.8 percent of their capital costs on average over time.[5]

Perhaps as a consequence, fixed asset investment in the UK has long been weak compared to other large, developed countries. According to the Office for National Statistics, the UK had the lowest average business investment of all OECD nations between 1995 and 2015.[6] Over the last seven years, the UK has had one of the two lowest investment-to-GDP ratios among G7 countries. For the last four years, it has been the lowest among the G7. In 2021, gross fixed capital formation in the UK was just 17.1 percent of GDP, compared to 22 percent in Germany and 24.4 percent in France.

4 HM Government, "Net Zero Strategy: Build Back Greener," Oct. 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf.

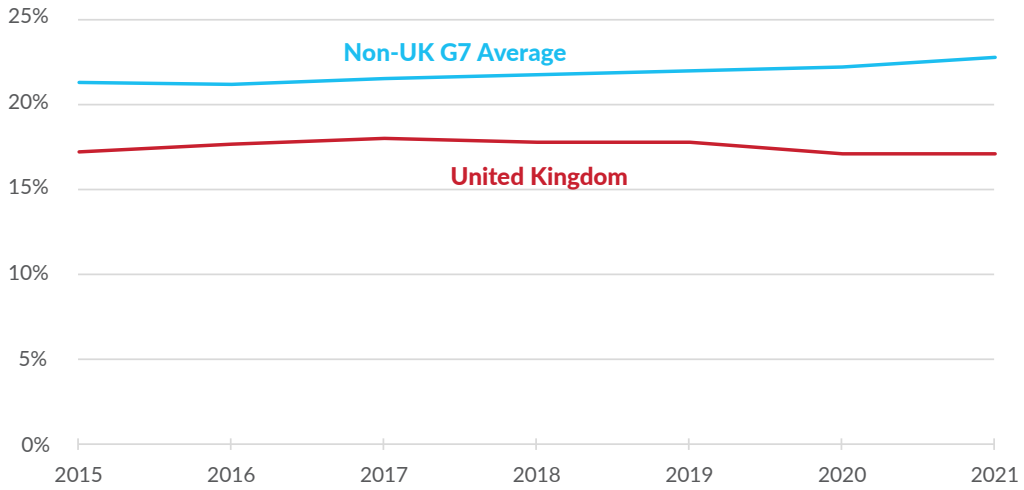
5 Elke Asen, "Capital Cost Recovery across the OECD," Tax Foundation, Mar. 31, 2021, https://taxfoundation.org/capital-allowances-capital-cost-recovery-2021.

6 Office for National Statistics, "An analysis of investment expenditure in the UK and other Organisation for Economic Co-Operation and Development nations," May 3, 2018, https://www.ons.gov.uk/economy/grossdomesticproductgdp/articles/ananalysisofinvestmentexpenditureintheukandotherorganisationforeconomiccooperationanddevelopmentnations/2018-05-03.

FIGURE 1.

UK Investment Has Lagged Behind Other G7 Countries

Gross Fixed Capital Formation as a share of Gross Domestic Product



Author's calculations using OECD.Stat, "Gross Domestic Product (Output Approach)" and "Gross Fixed Capital," OECD, accessed May 10, 2022.

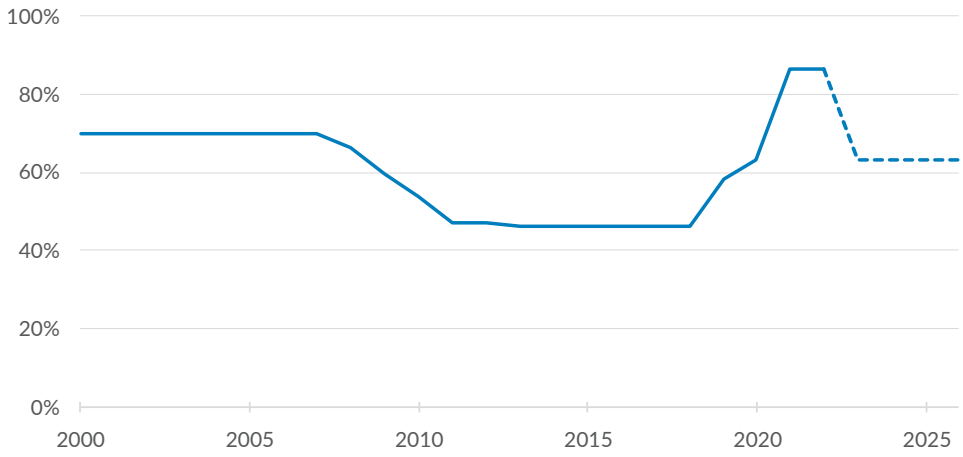
The super-deduction has temporarily boosted the net present value of capital allowances in the UK. Alongside the reintroduction (and later expansion) of the structures and buildings allowance, it has boosted the net present value of capital allowances available to businesses from a low of 46.3 percent in 2018 to the current high of 86.5 percent.

Once the super-deduction expires that metric is expected to fall back to 63.2 percent.

FIGURE 2.

The Tax Treatment of Capital Investments Will Worsen When the Super-Deduction Expires

Net present value of capital allowances in the UK



Note: The data account for machinery, buildings, and intangibles. To calculate the net present values, a fixed discount rate of 7 percent is assumed (fixed inflation rate of 2 percent and fixed real discount rate of 5 percent). Weighted averages are weighted by an estimate of each asset's respective share of the capital stock (machinery: 44 percent, industrial buildings: 41 percent, and intangibles: 15 percent).

Source: Author's calculations using the methodology in Lisa Hogreve and Daniel Bunn, "Capital Cost Recovery across the OECD," Tax Foundation, Apr. 26, 2022.

Pairing the super-deduction with a pre-announced corporate rate hike created offsetting incentives for business investment in the short term and indicated a higher burden on investment over the long term. A previous Tax Foundation paper found that under the default scenario, the overall tax burden on new investments would fall initially in 2021 before rising in 2023 alongside the expiration of the super-deduction and the corporate rate hike.[7] At the time, this was expected to create a whiplash effect on investment behaviour.

In fact, early indications suggest that the impact of the super-deduction has been lacklustre.[8] While that is disappointing, it should not undermine the case for reform more broadly: the evidence that tax systems with better capital cost recovery provisions boost investment is strong, and the super-deduction has clearly been hampered by its temporary nature and the challenging economic circumstances of the last two years.[9]

As the super-deduction expiration date gets closer, it will be important for the government to consider ways to support business investment through permanent policy.

The Default System of Capital Allowances

Once the super-deduction expires, businesses making investments that do not qualify for the Annual Investment Allowance (which is itself set to fall from £1m to £200,000) will have to deduct them via the existing system of capital allowances.

Under the UK system, plant and machinery are depreciated in two "pools" – an 18 percent pool and a special 6 percent pool (which pool you use depends on the expected economic life of the asset). Assets in each pool are depreciated on a "declining balance" basis. Companies are required to add the value of new plant and machinery to these pools. Then the total value of the pools is deducted at the pool's rate.

For example, suppose a company holds £100 in assets in the 18 percent pool. In the first year, it would receive an £18 deduction. The next year, the asset's adjusted basis would be £82 (£100 minus the first-year deduction of £18). The remaining value would be multiplied by 18 percent, yielding a second-year deduction of £14.76. This process would be repeated each year.

Buildings and structures can also qualify for depreciation allowances. Under current rules, qualifying industrial buildings are eligible for straight line depreciation at 3 percent a year. Under straight line depreciation, companies deduct 3 percent of the original value each year until the adjusted basis of the asset is zero. Structures that do not qualify for straight line depreciation (generally dwellings) do not receive any capital consumption allowances.

7 Daniel Bunn and Kyle Pomerleau, "Marginal Effective Tax Rates and the 2021 UK Budget," Tax Foundation, Mar. 23, 2021, https://taxfoundation.org/2021-uk-budget-tax-proposals.

8 Alison McCrae, "Business Investment results in the UK: July to September 2021 revised results," Office for National Statistics, Dec. 22, 2021, https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/businessinvestment/julytoseptember2021revisedresults#super-deduction.

9 On the economic impact of capital cost recovery, see Eric Ohrn, "The effect of tax incentives on US manufacturing: evidence from state accelerated depreciation policies", Grinnell College, September 2017, http://www.cs.grinnell.edu/~ohrneric/ files/State_Bonus/State_Bonus_9_2017.pdf; and Giorgia Maffini, Jing Xing, and Michael P. Devereux, "The impact of investment incentives: evidence from UK corporation tax returns", Oxford University Centre for Business Taxation, January 2016, http://eureka.sbs.ox.ac.uk/6145/1/WP1601.pdf.
On the effect of uncertainty on investment, see Robert K. Dixit and Robert S. Pindyck, *Investment under Uncertainty*, Princeton University Press, 1994, https://press.princeton.edu/books/hardcover/9780691034102/investment-under-uncertainty.

The treatment of intellectual property depends on whether it is produced or acquired. Intellectual property produced through research and development is generally expensed. Acquired IP, however, can be deducted at 25 percent, via a declining balance method. Some acquired IP, such as mineral rights, are deducted at a 10 percent declining balance.

Land and inventory are treated differently than fixed investments in structures, plant and machinery, and intellectual property. Land and inventory only receive a deduction for the initial purchase when sold. The amount a corporation gets for purchases of inventory depends on the accounting assumption used. In the United Kingdom corporations are required to assume "First In, First Out" (FIFO) accounting.

The value of capital allowances can be summarised by measuring the share of the initial investment that can be deducted in present value terms. Under the system outlined here, the present value of the depreciation allowance for plant and machinery in the standard pool (18 percent) is 72 percent and 46.2 percent for the special, 6 percent pool. The value of deductions for certain structures is 38 percent and zero for inventory, land, and dwellings.

TABLE 1.

Overview of Treatment of Different Investments

Type of Investment	Net Present Value of Tax Deductions
18% Pool	72.0%
6% Pool	46.2%
Structures	38%
Research and Development	100%
Acquired IP	78%
Land, Dwellings	0%
Inventory	0%

Note: Capital consumption allowances discounted at a real discount rate of 5% and inflation rate of 2%. Using the long-run averages is useful for comparison purposes even though it is clear that current higher levels of inflation will reduce the net present value of tax deductions relative to lower inflation levels in recent years.
Source: Authors' calculations.

Marginal Effective Tax Rates from April 2023

Marginal Effective Tax Rates (METRs) represent the share of pre-tax returns (net of economic depreciation) needed to cover taxes on a marginal investment. A marginal investment is one that just breaks even in present value – or, alternatively, one where the present discount value of the returns is equal to the market value of the asset.

The METR is a comprehensive measure that incorporates the statutory tax rate, deductions and credits that corporations receive for new investment, special tax regimes, and deductions for financing costs.[10] This makes it a good way to judge the overall stance of a tax system towards investment.

10 Kyle Pomerleau, "The Tax Burden on Corporations: A Comparison of Organisation for Economic Co-Operation and Development Countries and Proposals to Reform the US Tax System," American Enterprise Institute, Oct. 13, 2021, https://www.aei.org/research-products/report/the-tax-burden-on-corporations-a-comparison-of-organisation-for-economic-co-operation-and-development-countries-and-proposals-to-reform-the-us-tax-system.

Table 2, below, shows the METR on investment that UK businesses will face from April 2023, assuming no capital allowance reforms are introduced. We have assumed a 19 percent corporation tax rate.

TABLE 2.

Marginal Effective Tax Rates on Investment, April 2023

Plant and Machinery	13.8%
Structures	15.0%
Intellectual Property	-38.0%
Land	12.0%
Inventory	18.5%
Overall	**10.7%**

Source: Authors' calculations.

From April 2023, the weighted average marginal tax rate on new investment in the UK will be 10.7 percent. Investment in inventory (18.5 percent) and plant and machinery (13.8 percent) faces the highest tax burden, followed by structures (15 percent) and land (12 percent). Intellectual property receives a net subsidy (-38 percent). This is due to the tax treatment of research and development, which is fully expensed, can qualify for the R&D expenditure credit, and can benefit from the patent box, which reduces the statutory tax rate on some types of intellectual property to 10 percent.

In general, the effective tax rate on new investment is lower than the statutory tax rate because some assets are debt-financed. Debt-financed investment receives a deduction for interest expense.[11] For an asset that just breaks even, the value of the interest deduction fully offsets the tax burden on debt-financed investment. However, in the UK, interest deductions are partially limited.

Proposed Reform of Capital Allowances

The Spring Statement put forward five options for improving the tax treatment of investment in plant and machinery.[12]

The first was to increase the permanent level of the Annual Investment Allowance, which allows qualifying investments up to a certain limit to be immediately and fully expensed, from £200,000 to £500,000. While this would be helpful to smaller businesses and could be combined with other reforms to improve the system overall, it would not by itself eliminate the corporate tax system's bias against investment.

The other four reforms all involve augmenting (or replacing) the existing system of capital allowances. Each of the suggested options would increase the present discounted value of capital allowances for plant and machinery in the United Kingdom.

11 Subject to the "Corporate Interest Restriction," HM Revenue & Customs, May 16, 2022, https://www.gov.uk/guidance/corporate-interest-restriction-on-deductions-for-groups.

12 HM Treasury, "Spring Statement 2022," Mar. 23, 2022, https://www.gov.uk/government/publications/spring-statement-2022-documents/spring-statement-2022-html.

A. Enhanced writing down allowance rates for plant and machinery

This proposal would increase the rate at which plant and machinery are written down for each pool. The 18 percent (main rate) pool would increase to 20 percent and the 6 percent (special rate) pool would increase to 8 percent.

B. 40 percent first-year allowance for plant and machinery

This proposal would allow corporations to immediately deduct 40 percent of the cost of new investment in plant and machinery. The remaining value would then be deducted in the asset's corresponding pool. For example, a corporation that makes a £100 investment that qualifies for the standard 18 percent pool would receive a £40 deduction upfront and then the remaining value of the asset (£60) would be placed in the 18 percent pool and depreciated in the normal way.

C. 20 percent additional first-year allowance for plant and machinery

The 20 percent additional first-year allowance would work similarly to the 40 percent first-year allowance. The difference, however, is that the value of the new investment would not be reduced by 20 percent before being depreciated in the corresponding pool.

For example, a corporation that makes a £100 investment that qualifies for the standard 18 percent pool would receive a £20 deduction upfront and then would get a depreciation deduction of 18 percent of the original value (£100) in the first year. Then in each subsequent year they would depreciate the remaining balance at 18 percent as under the current system.

D. Full expensing for plant and machinery

Under this proposal, plant and machinery that qualifies for the 18 percent pool would be fully deducted the year in which it was placed in service. Special rate assets would receive an up-front deduction of 50 percent, with the remainder depreciated at 6 percent a year thereafter.

It is worth noting that while the Treasury has described this option as 'full expensing', that term would usually be reserved for a system that allowed (at a minimum) all investment in plant and machinery to be deducted in full in the first year.

Table 3, below, compares the impact of each of these proposals on the present discounted value of capital allowances for plant and machinery. However, we have added a column for 'pure' full expensing for plant and machinery.

Enhancing writing down allowance rates would increase the present value marginally for both pools from 72 percent to 74.1 percent and 46.2 percent to 53.3 percent.

The proposals to provide a large upfront deduction would have a somewhat larger impact on the value of the plant and machinery capital allowance. 40 percent first-year allowance would increase the value of the 18 percent pool to 83.2 percent and the special pool to 67.7 percent.

The 20 percent additional first-year allowance would raise the net present value of the 18 percent pool to 92 percent. However, this allowance would have a slightly smaller impact on the special pool than bonus depreciation, raising its present value to 66.2 percent.

The Spring Statement's version of full expensing would increase the net present value of capital allowances for main rate assets to 100 percent; for special rate assets, the net present value would only rise to 74 percent. Pure full expensing, by contrast, would allow complete capital cost recovery and increase the present value for both pools to 100 percent.

TABLE 3.

Impact of Reforms on net present value of capital allowances for plant and machinery

	2023 default	(a) Enhanced writing down allowance rates	(b) 40% first-year allowance	(c) 20% additional first-year allowance	(d) Spring Statement 'full expensing'	(e) Full expensing for plant & machinery
18% Pool	72.0%	74.1%	83.2%	92.0%	100.0%	100.0%
6% Pool	46.2%	53.3%	67.7%	66.2%	74.0%	100.0%

Note: Capital consumption allowances discounted at a real discount rate of 5% and inflation rate of 2%. Using the long-run averages is useful for comparison purposes even though it is clear that current higher levels of inflation will reduce the net present value of tax deductions relative to lower inflation levels in recent years.

Source: Authors' calculations.

The Impact of Reforms on Effective Tax Rates

The enhanced capital allowances outlined above would reduce the effective tax rate on investment in new plant and machinery. The impact of marginal tax rates corresponds with the increase in the present value of the consumption allowances.

Table 4 shows the METR on plant and machinery and overall investment in the UK under each proposal, assuming a 19 percent headline corporation tax rate.

TABLE 4.

The Impact of Capital Allowance Reform on the METR for New Investment

	Plant and Machinery	Overall
2023 default	13.8%	10.7%
(a) Enhanced writing down allowance rates	11.9%	10.5%
(b) 40% first-year allowance	6.1%	9.8%
(c) 20% additional first-year allowance	2.4%	9.3%
(d) Spring Statement 'full expensing'	-2.2%	8.8%
(e) Full expensing for plant & machinery	-8.6%	8.0%

Source: Authors' calculations.

Increasing the depreciation rate for plant and machinery from 18 percent to 20 percent would marginally reduce the tax burden on new plant and machinery from 13.8 percent to 11.9 percent.

The 40 percent first-year allowance for plant and machinery would reduce the marginal tax rate by roughly half, from 13.8 to 6.1 percent. The 20 percent additional first-year allowance would reduce the METR on plant and machinery to 2.4 percent.

Either version of full expensing would reduce the effective tax rate on new investment in plant and machinery below zero. This is because debt-financed assets would receive an interest deduction in addition to the more generous capital allowance for plant and machinery.[13] As a result, marginal investments would receive a net refund over their life.

Overall, these policies would have a small-to-moderate impact on the overall tax burden on corporate investment in the UK. The reason the reforms would not have a larger *overall* impact is that plant and machinery in the corporate sector only represent a small portion of the overall corporate capital stock. This means that while the METR for plant and machinery investment could fall dramatically depending on the reform option chosen, the tax burden on other assets would remain unchanged.

Other Options to Improve the Tax Treatment of Investment

The reform proposals that the Treasury has sought views on would undoubtedly improve the tax treatment of plant and machinery. But as noted above, restricting more generous tax treatment of capital investment to plant and machinery also limits the economic impact of the reforms because plant and machinery only represent a small portion of the entire capital stock.

In 2019, 12 percent of the corporate capital stock was plant and machinery. In contrast, structures (including dwellings) make up 33.8 percent of the corporate capital stock. Intellectual property, including research and development, comprises an additional 6 percent. The remaining 48 percent of the capital stock is comprised of land and inventory.

Given the importance of structures to the capital stock, improving their tax treatment (in addition to that of plant and machinery) could have a large impact on economic output in the United Kingdom. In particular, if lawmakers decided to extend expensing (or an equivalent treatment) to structures (excluding dwellings), the overall marginal effective tax rate on new investment would fall from 10.7 percent to 3.1 percent.

This much lower effective tax burden on new investment would greatly increase the incentive to invest and, as we will see below, significantly augment full expensing's potential impact on productivity and growth.

13 We assume that 35 percent of new investment is debt financed.

The Impact of Corporation Tax Reform on the Economy

Policy reforms that reduce the tax burden on new investment will increase the incentive for corporations to invest and therefore increase the size of the domestic capital stock. A larger capital stock will, in turn, result in increased labour productivity, higher wages, and higher economic output in the long run.

Table 5, below, shows the impact of various corporation tax scenarios on GDP, investment, and wages, according to our modelling (see Appendix for details). We have modelled the impact of each capital allowance reform option outlined in the Spring Statement, plus two of our own: 'pure' full expensing for plant and machinery, and the same approach extended to structures and buildings as well.

TABLE 5.

The Economic Impact of Capital Allowance Reform

	GDP	Investment	Wages
(a) Enhanced writing down allowance rates	0.1%	0.2%	0.1%
(b) 40% first-year allowance	0.3%	0.6%	0.3%
(c) 20% additional first-year allowance	0.5%	0.8%	0.4%
(d) Spring Statement 'full expensing'	0.7%	1.1%	0.6%
(e) Full expensing for plant & machinery	0.9%	1.5%	0.8%
(f) Full expensing for plant & machinery and structures & buildings	2.5%	4.2%	2.1%

Source: Author's calculations.

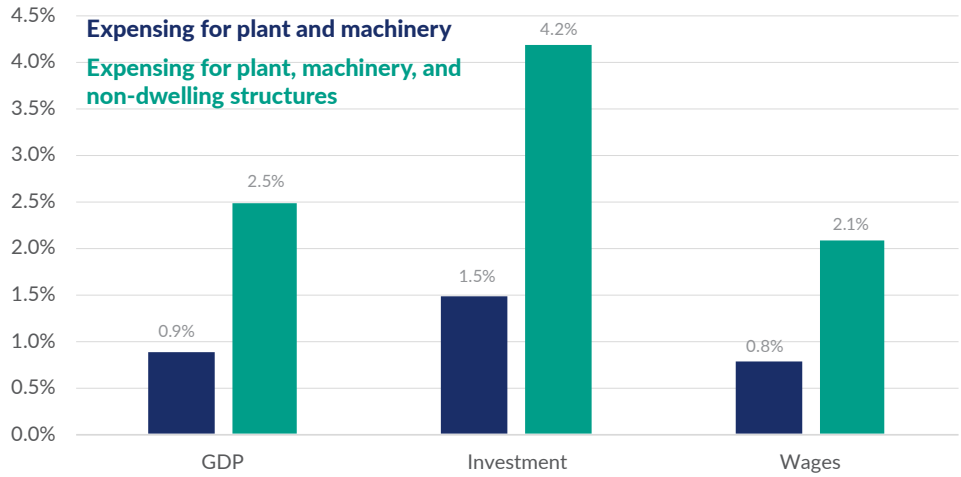
The impact of each reform scenario on GDP corresponds to its impact on the effective tax burden on new investment. In the long run, the more you reduce the tax burden, the greater the increase in output, investment, and wages. In other words, if growth is the goal, it pays to be as aggressive as possible in reforming capital allowances.

The economic impact of extending full expensing to structures and buildings, as well as plant and machinery, would be significant. This is because structures comprise a large portion of the UK corporate capital stock. Figure 3 compares the impact of different models of full expensing on GDP, investment, and wages.

FIGURE 3.

Extending Expensing to Structures Would Greatly Increase the Economic Impact of Reform

Long-run increase in GDP, investment, and wages



Source: Author's calculations.

These results reflect the impact reform would have on the *level* of output, investment, and wages. In other words, once the complete impact of full expensing for plant and machinery and structures and buildings has been felt, we would expect GDP to be 2.5 percent higher than it otherwise would have been, and for that increase to endure over time. As the economy adjusts to the new policy, the *rate* of economic growth would be somewhat higher than otherwise. For example, if it took 10 years to reach a 2.5 percent higher level of output, GDP growth would be approximately 0.25 percent faster each year over the next decade.

The Fiscal Cost of Capital Allowance Reform

If one wants tax reform to deliver the greatest possible economic benefits, the most far-reaching option is usually the 'best' one. However, all policies present trade-offs, and pro-growth tax reform is no exception. Any policymaker considering capital allowance reform will inevitably want to know how much it costs – that is, how much less revenue will the government raise as a result?

Table 6 displays our estimates for the fiscal cost of various capital allowance reforms, assuming a 19 percent headline rate. These calculations are 'static' – they do not take account of the behavioural and growth effects reform would have, which could be significant. Nor do they incorporate the 'cost' of keeping corporation tax at 19 percent, rather than raising it to 25 percent.

It is important to note that changes to cost recovery can impact revenue more in the short run than in the long run. This is because new assets will qualify for the new, larger deductions while old assets will continue to be deducted under the previous regime. Over time, the cost falls as old assets under the previous regime are retired, leaving the much lower annual cost of accelerating deductions on new investment. For example, the peak year cost of full expensing for plant and machinery is more than £9bn, but in the long run its cost declines to £1.6bn per year.

Box 1-1 The Impact of Maintaining a 19 percent Headline Rate

In 2021, former Chancellor of the Exchequer Rishi Sunak proposed raising the corporate income tax rate from 19 percent to 25 percent in 2023. Prime Minister Liz Truss has indicated that she will cancel this rate increase.

The decision to keep the headline rate of corporation tax at 19 percent instead of raising it to 25 percent will reduce the effective tax burden on new investment. Overall, the marginal effective tax rate (METR) would fall by 4.4 percentage points from 15.1 percent to 10.7 percent. The METR would fall by roughly the same amount for all investment except intellectual property products, which would see a slight tax increase.

The small tax increase on IP is due to its special tax treatment. Many IP assets are expensed and face no tax at the margin for equity-financed investment regardless of the statutory tax rate. Debt-financed investment, in contrast, would face a tax increase as the value of the interest deduction falls from 25 percent per pound to 19 percent per pound. Other IP assets are not expensed and can potentially benefit from the lower rate. However, these assets can also qualify for the patent box, a lower tax rate on IP income, which remains fixed at 10 percent regardless of the corporate tax rate.

The Impact of Reducing the Corporate Tax Rate on the METR for New Investment

	25% Corporate Tax Rate	19% Corporate Tax Rate
Plant and Equipment	18.6%	13.8%
Structures	19.9%	15.0%
Intellectual Property	-38.3%	-38.0%
Land	16.3%	12.0%
Inventory	24.3%	18.5%
Overall	15.1%	10.7%

Source: Author's calculations.

Overall, the lower corporate income tax rate would have a strong, positive effect on the economy before the enactment of any capital cost recovery reforms. We estimate that maintaining a 19 percent corporate tax rate results in higher GDP (up 1.2 percent), investment (up 2 percent), and wages (up 1.1 percent) in the long run compared to permanently raising the corporate income tax rate to 25 percent.

The economic estimates elsewhere in this paper are relative to a permanent 19 percent corporate tax rate.

Just as it was striking in the previous section how much adding structures and buildings to full expensing boosts the policy's growth effects, it is striking here just how much more extending full expensing to structures and buildings would cost. Effectively, it makes full expensing more than twice as expensive in the peak year, and more than six times as expensive (on an annual basis) in the long run.

However, it might be possible to replicate the economic benefits of full expensing for structures at a lower cost by adopting an approach known as neutral cost recovery. This policy would continue to have structures depreciated in line with their set schedules. However, the tax basis for determining capital allowances for these assets would be adjusted upward each year. The basis adjustment would offset the loss in the value of deductions due to inflation and the time value of money. In principle, these assets would receive deductions that equal, in present value terms, a full and immediate deduction.[14] As such, the economic benefits from neutral cost recovery should, at least in theory, be identical to those from full expensing.

TABLE 6.

The Fiscal Cost of Capital Allowance Reform (Static Analysis)

	Peak year cost (£bn)	Long-run annual cost (£bn)
(a) Enhanced writing down allowance rates	1.5	0.2
(b) 40% first-year allowance	2.3	0.5
(c) 20% additional first-year allowance	3.0	1.1
(d) Spring Statement 'full expensing'	8.4	0.9
(e) Full expensing for plant & machinery	9.3	1.6
(f) Full expensing for plant & machinery *and* structures & buildings	22.6	10.0
(g) Full expensing for plant & machinery and neutral cost recovery for structures & buildings	13.9	9.8

Source: Authors' calculations.

Making Expensing Work Better

Expensing eliminates the tax burden on new investment because the tax value of the upfront deduction is equal to the taxes a business expects to pay on the investment's returns. This, however, only works in practice if companies can fully and immediately receive the deduction. In some cases, companies may not receive the full value of the deduction because they are making a loss. This reduces the effectiveness of expensing. Policies are needed to address this issue.

14 Suppose a company invests in a £1 million facility. The structures and buildings allowance would provide a £30,000 deduction each year for 33 1/3 years. However, inflation and the time value of money will erode those deductions, especially in later years. Under neutral cost recovery, the government would allow the company to receive a deduction equal to the 3 percent allowance *plus* an adjustment for the annual rate of inflation and the rate of interest on high-quality corporate (or government) bonds. So, in the second year, the basis of that investment would rise to £1.05 million assuming an adjustment of 5 percent (3 percent interest plus 2 percent inflation). The corporation would then receive a deduction of £31,500.

Under current law, businesses that generate a net loss in a given year do not receive an immediate refund of taxes. Instead, losses must be carried forward and deducted against positive taxable income in future years. In the UK, there are some restrictions on net operating losses. Loss carryforwards are limited to £5 million plus 50 percent of remaining profits. If losses are generated by new investments, businesses effectively lose the ability to fully recover the costs of new investments. The impact will depend on how long companies need to carry losses forward before it is fully utilised.

One option to address this is to expand the generosity of losses. This could be done by allowing companies to carry back losses to previous years and receive a refund on prior-year taxes. Another option would allow companies to carry forward losses but adjust those losses each year for the time value of money. In practice, this means that companies would adjust the value of unused losses at a prescribed interest rate each year.

Policy Recommendations

In economic terms, the best thing policymakers could do when the super-deduction expires next year is introduce full expensing – not just for plant and machinery, but for structures and buildings too. That means complete, up-front deduction of capital investments from corporation tax in the year they are made.

The modelling in this paper suggests that such a 'full fat' version of full expensing would boost investment by 4.2 percent, wages by 2.1 percent, and GDP by 2.5 percent in the long run. A more restrictive version of this policy, applying only to plant and machinery, would boost long-run output by 0.9 percent, increasing wages and investment by 0.7 percent and 1.5 percent, respectively.

The challenge with both options is their fiscal cost, especially in the short term. Full expensing for plant and machinery might cost £9.3bn in the peak year, and around £1.6bn a year in the long run. Extending the same tax treatment to structures and buildings would significantly increase the policy's costs to £22.6bn in the peak year and £10bn a year in the long run.

Given the new government's clear commitment to raising economic growth, they should be as bold as possible when reforming capital allowances. From a competitiveness standpoint, moving towards some version of full expensing is one of the best possible reforms that could be made to the tax system.

If short-term revenue losses are a concern, the government could consider using the neutral cost recovery approach to realize the economic benefits of full expensing, while spreading the fiscal impact over time. One practical option would be to combine a permanently higher Annual Investment Allowance with neutral cost recovery applied to writing down allowances and the structure and buildings allowance. Essentially, this would mean 'full expensing' for certain assets up to an annual limit, and then an economically-equivalent approach (at least in theory) for everything else.

Whichever option the government chooses, it is vital that reforms are *permanent*. Short-term measures might boost investment temporarily, but only lasting reform will have a pronounced and sustainable impact on jobs, wages, and long-run economic growth. The new government must move away from the regime uncertainty of recent years and provide businesses with the confidence they need to embark on big, long-term investment plans.

Appendix

Marginal Effective Tax Rate

The calculation of the marginal effective tax rate (METR) on new investment starts with the standard service price of capital formulation from Hall and Jorgensen (1967). The service price of capital is the gross return required to cover tax, economic depreciation, and the return demanded by shareholders.

$$S = \frac{((r - \pi) + \delta)(1 - uz - k)}{(1 - u)}$$

Where S is the service price of capital, r is the firm's nominal discount rate, π is the inflation rate, δ is economic depreciation, u is the statutory tax rate, z is the present discounted value of depreciation deduction, and k is the value of any investment tax credit, net of any taxes paid on the credit.

The firm's discount rate is the weighted average required return on debt- and equity-financed investment:

$$r = (i + \pi)(1 - f) + \big((i + \pi)(1 - ub)\big)f$$

i is the real interest rate, π is the inflation rate, f is the share of debt-financed investment, u is the statutory tax rate, and b is the share of debt deductible against corporate taxable income.

The marginal effective tax rate on an asset is equal to the difference between the pre- and post-tax return on an investment divided by the pre-tax return:

$$Marginal\ Effective\ Tax\ Rate = \big((S - \delta) - i\big)/(S - \delta)$$

The pre-tax return is the service cost of capital, S, minus economic depreciation, δ. The after-tax return, i, is the real interest rate.

Macroeconomic Model

The macroeconomic model used in this analysis is a comparative statics model of the UK economy. The model makes four primary assumptions. First, the model is a small open economy. As such, the after-tax return on investment (before shareholder taxes) is constant in the long run. Second, labour and capital's share of gross output and each non-government sector's share of output is constant in the long run. Third, the inflation rate is held constant. Fourth, tax changes are permanent and government debt is sustainable in the long run.

Estimates of output, investment, and wages are produced using a model based on a Cobb-Douglas production function with constant returns to scale. The production function estimates total output as a function of labour and capital. The model includes four sectors:

general government, nonfinancial corporations, financial corporations, and households and institutions. Output in each sector, *i*, is formulated as:

$$Y_i = A_i * K_i^{a_i} * L_i^{(1-a_i)}$$

Where *Y* is total output (in pounds), *A* is a constant that represents total factor productivity, *K* is capital (measured in pounds), *L* is labour (measured in hours), and *a* and (*1*-*a*) are constants representing the output elasticity for capital and labour, respectively. The output elasticities for capital, *a*, and labour (*1*-*a*) are:

$$a_i = (S_i * K_i)/Y_i$$
$$(1 - a_i) = (w_i * L_i)/Y_i$$

S_i is the service price of capital observed in each sector. In the nonfinancial corporate sector, for example, the service price is equal to profits, net interest, and the consumption of fixed capital divided by *K*, the total nonfinancial corporate capital stock. *K* is the sum of plant and machinery, structures, intellectual property, inventories, and land. *w* is the wage rate.

To simulate a change in the economy, the service price of capital is re-estimated based on changes to tax policy according to the formula used to estimate the marginal effective tax rates. With a fixed after-tax return, *r*, a lower tax burden on new investment, for example, reduces the service price of capital and increases companies' demand for productive capital.

The model assumes that people choose between leisure and work based on the real after-tax wage rate. The model uses a single pool of labour for the entire economy. As such, all sectors have the same pre-tax wage rate and the same elasticity of hours worked with respect to the after-tax wage: 0.2. The labour supply is equal to:

$$ln(L) = ln(d) + e * ln(w * (1 - t))$$

Where *d* is a calibration constant, *e* is the labour force elasticity, *w* is the wage rate, and *t* is the marginal tax rate on labour.

Main Model Parameters, Data, and Assumptions

Appendix Table 1, which follows, outlines the policy and economic parameters used for this analysis. In our analysis of marginal effective tax rates, we assume that the real interest rate is 5 percent, and the inflation rate is 2 percent. We followed OECD and assumed that 35 percent of investment is debt financed at the margin and 65 percent is equity financed.

In estimating the weighted average service price of capital for the METRs and the economic model, we weighted each type of capital by its share of the total nonfinancial corporate capital stock in the United Kingdom. Each of the 14 types of capital was matched with the appropriate cost recovery regime. The 14 types of capital were then aggregated into six major categories—Plant and Machinery, Other Structures, Dwellings, Intellectual Property,

Land, and Inventories—and matched with economic depreciation rates used in an analysis by the Oxford University Centre for Business Taxation. These rates range from 17.5 percent for plant and machinery to 0 percent for land and inventories.

Our analysis assumes long-run inflation of 2 percent, which is lower than recent inflation in the UK. It is more appropriate to use a long-term inflation number as investment decisions are made considering the future path of inflation. That said, higher inflation (and higher interest rates due to central bank tightening) impact effective tax rates in different directions. Inflation drives up the cost of equity-financed capital investments, while higher interest rates increase tax deductions for interest payments and make debt-financed investments relatively more attractive from a tax perspective.

TABLE A1,

Overview of Major Parameters

Economic Parameters	
Real Interest Rate	5%
Inflation	2%
Share of Investment Debt-Financed	35%
Economic Depreciation Rates	
Plant and Machinery	17.50%
Other Structures	3.10%
Dwellings	3.10%
Research and Development	15.35%
Other Intellectual Property	15.35%
Land	0%
Inventories	0%
Inventory Holding Period (Years)	0.333
Tax Parameters	
Corporate Tax Rate	25%
Patent Box Rate	10%
R&D Tax Credit Rate	13%
Share of Interest Deductible	85%
Tax Treatment of Inventories	FIFO
Cost Recovery Parameters (z)	
Plant and Machinery	Declining Balance, 18% or 6%
Other Structures	Straight Line, 3%
Dwellings	N/A
Research and Development	Expensed
Other Intellectual Property	Declining Balance, 25%
Land	N/A

Source: Author's calculations.

Intellectual property products were split into two major categories: research and development, which qualifies for the R&D tax credit, and acquired IP, which does not. We further assumed that one-third of each type of IP qualifies for the patent box—the special 10 percent tax rate on qualifying IP income.

Data on output and the capital stock for each sector is from the UK's Office of National Statistics.

Policy Costings

Long-Run Cost. The long-run cost for each option is based on the 25-year net present value (NPV) of the total investments made in a given year; in other words, the sum of present values (PVs) in each of the 25 years for an investment made in year zero. New investment in a given future year is based on Office of National Statistics (ONS) trendline gross fixed capital formation data.

In each option, present values are derived by applying to the main and special rate pools the appropriate annual deductions (which in some cases is 100 percent in year zero) as well as a compound discount rate of 5 percent per annum to capture the time value of money.

The revenue cost of each other option versus the default option is then calculated by finding the remainder of the original investment not used to offset tax and applying appropriate effective marginal corporate tax rates (derived from averaging the five most recent years of data for UK companies) and adjusting for a 19 percent headline rate of corporation tax. Note that the modelling of the fiscal costs is static, not dynamic.

Peak Cost. Peak costs are calculated based on Treasury consultation figures with proportionate adjustments to capture:

a) Additional fixed capital brought into capital expensing under different options.

b) The fiscal costs under a 19 percent headline rate of corporation tax as opposed to a 25 percent headline rate, with costs under the 19 percent rate obtained by discounting the costs given or derived for the 25 percent regime by a factor of 0.76.