Winners and Losers: How Corporate Tax Reforms Reshape the Firm Distribution*

Riccardo Silvestrini† Elliott Weder‡

August 7, 2025

[Latest Version]

Abstract

We study how corporate tax reforms affect the distribution of resources across firms. Motivated by a Dutch fiscal reform, we use a heterogeneous firm model to test whether a lower tax rate coupled with reduced investment deductibility improves allocative efficiency. We find that aggregate productivity increases and capital misallocation declines, driven by the reallocation of capital from medium-large firms to the largest and most productive. The tax cut disproportionately benefits top firms, enabling their expansion, while the deductibility reduction burdens medium-large firms that invest more intensively than others.

Keywords: Corporate Taxation, Investment, Distribution, Allocation
JEL Codes: E22, E62, L11

*We wish to thank Rui Albuquerque, Matteo Bizzarri, Timo Boppart, Jeff Campbell, Chiara Lacava, Agnieszka Markiewicz, Julien Sauvagnat and the participants of seminars at the University of Naples Federico II, the Erasmus University Rotterdam, the 7^{th} Annual CefES Conference, and Theories and Methods in Macroeconomics 2025 for their helpful comments and suggestions.

†University of Naples Federico II and CSEF, `riccardo.silvestrini@unina.it`

‡Erasmus University Rotterdam and Tinbergen Institute, `weder@ese.eur.nl`

1 Introduction

Corporate tax reforms are a central policy instrument that governments use to influence firms' investment decisions. For example, tax rate cuts or more generous investment deduction allowances may lower the cost of investment and doing business, which encourages firm entry and growth, and attracts foreign capital. This paper studies the long-run, cross-sectional impact of corporate taxation on the distribution of resources across firms. We ask: what types of firms benefit from corporate tax reforms? Small or large, less productive or more productive? How do these distributional effects shape allocative efficiency?

To that end, we propose a heterogeneous firm model with two tax policy levers. Firms pay taxes on the profits they earn and can deduct a share of current and past investment expenditures from their taxable income. Both tax components alter and distort firms' investment choices. Within this model environment, we test whether a lower tax rate coupled with reduced investment deductibility redistributes capital across heterogeneous firms and can improve allocative efficiency.

We anchor our quantitative analysis in an actual tax reform implemented in the Netherlands in the mid-2000s. The Dutch government significantly reduced the statutory corporate tax rate from 34.5% to 25.5% to encourage firm entry, investment, and growth. To conserve budget neutrality, the annual tax deductibility of investment costs was lowered from 100% to 20%, which broadened the taxable income of firms and diluted the tax benefits of investment over time. We calibrate our model with pre-reform Dutch administrative data and embed the real-world tax parameters into our model. Key for our results, as we discuss below, the model and data show an inverse correlation between firm size (capital) and investment rates (investment over capital).[1]

In our model, we evaluate how the tax reform reshapes allocative efficiency along two complementary dimensions: input misallocation, following Hsieh and Klenow (2009), and aggregate productivity, measured by the Solow residual. Together, the metrics allow for a structured test of whether the tax reform improves the alignment of firm productivity and capital allocation. Our model predicts that allocative efficiency improves under the reform: aggregate productivity increases by 1.3% and capital misallocation falls by 4.3%. After decomposing the separate effects of both policy levers, we find that the deduction cut, not the tax rate cut, drives the majority of the efficiency gains.

[1] The result stems from mean-reversion in the random productivity process embedded in our model.

Gains in allocative efficiency are driven by capital reallocation toward the most productive and largest firms. In the full reform scenario and both the counterfactual settings, in which only the tax rate or investment deductibility is adjusted, the top 5% of firms by size see their share of aggregate capital increase by 0.6–2.2 percentage points (pp). Similarly, the top 5% most productive firms see their share expand by 0.3-1.5pp. These shifts are almost entirely offset by losses among firms in the 50th-95th percentiles of the respective distributions, indicating a redistribution away from medium-large and medium-high-productive firms.

The capital reallocation emerges from two mechanisms operating in the model, which both favour the most productive and largest firms. First, the lower tax rate increases after-tax profits for every firm; however, the most profitable firms gain disproportionately from the windfall gain. Because size, productivity, and profitability are tightly connected in the model equilibrium, top firms expand the most following the reform. Therefore, the share of aggregate capital held by the largest and most productive firms increases. Second, even though the reduced investment deductibility raises the effective cost of investment for everyone, firms that invest relatively intensively are disproportionately burdened. In the data and our calibrated model, medium-large firms invest aggressively to grow faster. The average investment-to-capital rate for medium-large firms is twice as high as that of the top 5% largest firms. Removing immediate expensing defers their tax benefits, causing them to contract. Capital consequently reallocates towards the largest and most productive incumbents, whose lower investment intensity insulates them from the deductibility change. Both mechanisms reinforce each other in the full reform, jointly triggering the reallocation of capital in the cross-section.

Finally, we simulate a revenue-neutral version of the reform. By simulating a budget-neutral reform, we show that our allocative efficiency and reallocation results are not caused by general equilibrium effects in an unbalanced tax reform, and we cross-validate our model's tax revenue predictions. We find that setting the deductibility cap at 23.8%, rather than the actual 20%, would have preserved budget neutrality with the same statutory tax rate cut. The allocative efficiency improvements are virtually unchanged. Capital misallocation declines by 3.9% instead of 4.3%, and aggregate productivity increases by 0.9% rather than 1.3%.

Related literature

Our theoretical model is most closely related to Hopenhayn and Rogerson (1993). We add capital, investment, and corporate fiscal policy to their model, since we focus on frictions in the allocation of capital rather than of labour. Furthermore, we include both adjustment and irreversibility frictions for capital investment. Cooper and Haltiwanger (2006), Cooper, Haltiwanger, and Power (1999), and Clementi and Palazzo (2016) show that both model features are necessary to improve the match with the data and to characterise realistic investment decisions.

Erosa and González (2019), Sedláček and Sterk (2019), Baley and Blanco (2022), and Colciago, Lewis, and Matyska (2024) all study the long-run effects of corporate taxation in heterogeneous firm models. In contrast to these papers, we focus on general measures of allocative efficiency and the link to the redistribution of capital. Furthermore, we highlight the predominant role investment deductions play in affecting the misallocation and reallocation of capital across, especially incumbent, firms.

We also relate to a large empirical literature that examines how firms' decisions, in particular investment, respond to tax policy changes. For a comprehensive survey of both the theory and the empirics behind this topic, see Chodorow-Reich (2025). Several papers study the response of firm investment to tax rate and investment deductibility changes, the two tax levers we analyse in this paper.

Zwick and Mahon (2017) find that increased expensing raises investment in eligible capital. They also document that the response of larger firms is less elastic to the policy. Similarly, the reallocation following the deduction cut in our model is generated by medium-large (specifically not the largest) firms responding the strongest. Ohrn (2018) finds that lower effective tax rates increase firms' investment. Our model provides similar results. Chodorow-Reich, Smith, Zidar, and Zwick (2024) and Chodorow-Reich, Zidar, and Zwick (2024) study the effects of the 2017 Tax Cuts and Jobs Act (TCJA), in which the statutory tax rate was cut and immediate expensing was introduced. The authors find that firms more exposed to the fiscal reform increased their domestic investment.

Still, it is important to mention that there is no consensus in the literature on the firm-level outcome of tax reforms, even when the same policy reform is analysed. Most notably, Yagan (2015) does not find a significant effect of the 2003 Jobs and Growth Tax Relief Reconciliation Act on firm investment. The reform comprised one of the largest cuts to dividend taxation in US history. Other papers that study the effect of corporate taxation on firm investment include Becker, Jacob, and Jacob (2013), Campbell, Chyz, Dhaliwal, and Schwartz Jr (2013), Link, Menkhoff, Peichl, and Schüle (2023), Lichter et al. (2025), and Bilicka, Güçeri, and Koumanakos (2025).

We complement the empirical literature in two ways. First, we examine how expensing and rate changes unfold in the cross-section in a general equilibrium model. We analyse how capital reallocates across firms that differ in their size and productivity. Second, a key difference of the Dutch reform is that policymakers aimed to keep the policy change budget neutral, unlike in, for example, the TCJA. The Dutch reform was not intended to be purely an investment subsidy for firms. Therefore, the implications for corporate tax revenue, firm-level investment, and welfare are not obvious in our setting. We shed light on reallocation and allocative efficiency following a tax reform with a tangible tradeoff between profit taxation and investment deductibility for firms.

Outline

The remainder of the paper proceeds as follows. Section 2 presents an overview of the Dutch reform we study. Section 3 introduces our model, which we calibrate in Section 4. Section 5 describes the main results of the paper, together with the budget-neutral version of the reform, while Section 6 concludes.

2 Institutional Background

We next turn to the policy context that is the running example in our paper. While our theoretical model, which we introduce in the next section, captures general economic mechanisms relevant across a wide range of advanced economies, our quantitative analysis is organised around the 'Working on Profit Act' introduced in the Netherlands from 2005 to 2007. The reform, detailed further below, was instituted against the backdrop of rising international tax competition, particularly within Europe, to attract multinational investment and retain successful domestic firms (Tweede Kamer der Staten-Generaal, 2006).

The core feature of the reform was a reduction in the statutory corporate tax rate from 34.5% to 25.5%. By increasing after-tax profits, the government aimed to encourage investment and firm entry, especially from multinationals. Additional changes in the reform concerned loss carryforwards, interest deductibility, preferential tax rates for small and medium-sized enterprises, and deductions for patent-related innovation.

To offset the tax revenue loss from the rate cuts and exemptions, the reform simultaneously broadened firms' tax base by reducing the tax deductibility of fixed asset investment. In fact, the Dutch government claimed "the measures are made possible by... broadening the [tax] basis" (Eerste Kamer, 2006). Concretely, firms were able to immediately and fully expense eligible investments before the reform. Afterwards, only 20%

of costs could be deducted annually, which spread out the tax benefits of the investment.

In our quantitative analysis, we focus solely on the headline rate cut and fixed asset investment deductibility parts of the policy change. We do not attempt to model any other features for two reasons. First, other corporate tax packages, such as the 2017 TCJA in the US and several reforms during the 2010s in the UK, also combine changes to the tax rate and deductibility of investment. Attempting to model every component of the Dutch reform would reduce the relevance of our model and results to broader policy contexts. Second, isolating just two tax policy levers ensures tractability and highlights mechanisms with direct and well-studied effects on firm-level investment incentives. As we mentioned, though, a key difference of the Dutch reform from other similar reforms is that investment deductions were reduced, not increased. This choice clearly changes the cost of the policy from a fiscal perspective. For example, in the TCJA, the tax rate was reduced and 100% bonus depreciation was implemented. Chodorow-Reich, Smith, et al. (2024) find that the provisions in the TCJA mechanically generate a 42pp reduction in tax revenue. Conversely, in our policy experiments, the implications for tax revenues, reallocation, and allocative efficiency are not obvious *ex ante*.

Nevertheless, our analysis should not be interpreted as an evaluation of the Dutch policy change. Rather, we combine two aspects of the reform and our access to exceptionally rich firm-level data to discipline our model and test the allocative implications of a targeted tax policy.

3 The Model

Our model builds on the investment framework from Winberry (2021), to which we include endogenous entry and exogenous exit of firms in the spirit of Hopenhayn and Rogerson (1993). The supply side of the economy incorporates an endogenous mass of heterogeneous firms, which produce using capital and labour. Firms pay taxes on their profits and can deduct a portion of their capital investment costs for tax purposes. Furthermore, investment is subject to capital adjustment costs and an irreversibility constraint. The model is closed by a representative household, which consumes, supplies labour and invests in the creation of new firms; and by a government, which levies taxes on firms and transfers the revenue back to the household. Time is discrete and indexed by t. A mass of length $\mathcal{M}_t$ of heterogeneous firms populates the economy. Each firm is indexed by the subscript j.

3.1 Firms

3.1.1 Production, Investment, and Profits

At time t, firm j produces output y_{jt} using two inputs, labour l_{jt} and capital k_{jt}. Firm j owns its capital stock - it is not rented from the household. The production function is given by a constant-returns-to-scale Cobb-Douglas technology:

$$y_{jt} = z_{jt} l_{jt}^{1-\alpha} k_{jt}^{\alpha}, \tag{1}$$

in which α represents the output elasticity of capital in the production function. z_{jt} denotes the idiosyncratic productivity level, which follows an AR(1) process in logs, with mean reversion:

$$\log z_{jt+1} = \rho^z \log z_{jt} + (1-\rho^z) \log \bar{z}_{jt} + \omega^z_{jt}, \quad \text{with} \quad \omega^z_{jt} \sim N(0, \sigma^z). \tag{2}$$

The stationary distribution of the productivity process in levels is given by a log-normal distribution, which we call $G(z)$. Upon entering a period, firms observe a new productivity draw, their pre-existing stock of capital k_{jt}, and their tax deduction allowance d_{jt}, which we define below. Within each period, firms hire l_{jt} workers at the aggregate wage w_t to produce. The labour choice is fully static. Firms also choose investment i_{jt} into new capital.[2] The investment choice is dynamic. Given the investment choice i_{jt}, firm j's capital evolves according to the following law of motion:

$$k_{jt+1} = (1-\delta) k_{jt} + i_{jt}. \tag{3}$$

Whenever investment is non-zero, firms incur a convex adjustment cost $\mathcal{C}_{jt}$. The cost is measured in terms of output and is defined in more detail below.

We move on to corporate taxation. To reflect real-world corporate tax codes, labour and investment are subject to differential tax treatment. While labour costs are fully deductible in the period in which they occur, only a fraction $\hat{\delta}$ of investment costs are deductible. The partial deductibility of investment costs creates dispersion in the effective tax rate paid by firms. Conditional on pre-tax profitability, firms that invest more pay fewer taxes and see their after-tax profits rise. We assume a geometric deduction scheme: the fraction of investment that is not deducted in period t is carried over to the following period, together with any remaining pre-existing allowance d_{jt}.[3] Therefore,

[2] When simulating the model, we assume investment is irreversible, i.e. $i_{jt} \geq 0$, although results are similar if we allow for direct disinvestment.

[3] Although in the data depreciation schemes are often linear, working with a geometric scheme comes with computational advantages and does not diverge significantly from the data. For a further discussion, see Furno (2021) and Winberry (2021).

the deduction allowance evolves with the following law of motion:

$$d_{jt+1} = (1-\hat{\delta})\left(d_{jt}+i_{jt}\right). \tag{4}$$

Then, firm profits π_{jt} are equal to cash flow $\mathcal{I}_{jt}$ (i.e., *before-tax* profits) minus taxes paid on taxable income $\mathcal{T}_{jt}$ and adjustment costs $\mathcal{C}_{jt}$:

$$\pi_{jt} = \mathcal{I}_{jt} - \tau\mathcal{T}_{jt} - \mathcal{C}_{jt}. \tag{5}$$

$\mathcal{I}_{jt}$ denotes cash flow, which is defined as revenues net of period-t costs:

$$\mathcal{I}_{jt} = y_{jt} - w_t l_{jt} - i_{jt}.$$

$\mathcal{T}_{jt}$ represents the taxable income, which is taxed at the linear corporate tax rate τ:

$$\mathcal{T}_{jt} = y_{jt} - w_t l_{jt} - \hat{\delta}\left(i_{jt}+d_{jt}\right).$$

Taxable income is equal to output net of fully deductible labour costs $w_t l_{jt}$ and partially deductible investment costs $\hat{\delta}\left(i_{jt}+d_{jt}\right)$. We assume the adjustment costs are convex and given by the following function form, as in Winberry (2021):

$$\mathcal{C}_{jt} = \frac{\psi}{2}\left(\frac{i_{jt}}{k_{jt}}\right)^2 k_{jt} \equiv \mathcal{C}\left(i_{jt},k_{jt}\right).$$

We assume that the price of output (consumption) is the numeraire, so revenues $p_t y_{jt}$ are equivalent to output y_{jt}. Even though we assume perfect competition, firms can still make positive profits because of entry costs and technological rents due to productivity differences and investment frictions.

For the remainder of this subsection, it is easier to formulate the firm maximisation problem recursively. Let x' indicate the next-period value of a variable x. The state variables for a firm are then given by current (idiosyncratic) productivity z, the existing capital stock k, and the deduction allowance d, which together fully identify each firm j. Therefore, we represent the state variables for a firm with the triplet $\{z,k,d\}$ and express the Bellman equation as:

$$V(z,k,d;\mu) = \max_{i,l}\{\pi(\mu) + (1-\gamma)\,\mathbb{E}\left[\Lambda(\mu)V(z',k',d';\mu')|z,k,d,\mu\right]\}.$$

μ represents the aggregate distribution of firms over the individual states, $\Lambda(\mu)$ stands for the stochastic discount factor, and γ is the probability of exiting between periods. We discuss entry and exit further in the next subsection. Substituting in the production function, adjustment cost function and the two laws of motion, the Bellman equation can be rewritten as:

$$\begin{aligned} V(z,k,d;\mu) &= \tau\hat{\delta}d + (1-\tau)\max_{l}\{\left[zl^{1-\alpha}k^{\alpha} - w(\mu)l\right]\}+ \\ &+ \max_{i}\{-\left(1-\tau\hat{\delta}\right)i - \frac{\psi}{2}\left(\frac{i}{k}\right)^{2}k + (1-\gamma)\,\mathbb{E}\left[\Lambda(\mu)V(z',k',d';\mu')|z,k,d,\mu\right]\}, \end{aligned} \tag{6}$$

subject to:

$$\log z' = \rho^{z}\log z + (1-\rho^{z})\log\bar{z} + \omega^{z}, \quad k' = (1-\delta)k + i \quad \text{and} \quad d' = (1-\hat{\delta})(d+i).$$

You can see from the rewritten Bellman equation that the firm maximisation problem leads to two policy functions. The first maximisation demonstrates the optimal labour demand choice $l^{*}(z,k,d;\mu)$ is static and chosen such that the marginal product of labour $(1-\alpha)z\,(l/k)^{-\alpha}$ equals the aggregate wage $w(\mu)$. Second, the dynamic optimal investment choice $i^{*}(z,k,d;\mu)$ will equate the current marginal costs to future marginal benefits of investment.

Investment today raises current costs due to forgone profits and adjustment frictions. However, it also boosts a firm's value by increasing future capital and tax deduction allowances. More future capital increases future profits through higher revenues and reduced adjustment costs, while larger deductions raise after-tax profits by expanding the tax shield.

3.1.2 Entry, Exit, and the Distribution of Firms

Entry is endogenous. An unbounded mass of potential entrants is prepared to join the economy in every period t. Entry occurs up to the point where the expected value of the entry equals entry costs $w_t c_e$, which we assume are paid in terms of labour. We denote the mass of entrants in period t by M_t. Entrants learn their productivity only after paying the entry cost, which they draw from the stationary distribution $G(z)$. Entrants immediately start producing with an initial level of capital k_0 and zero deduction allowance.[4] Hence, the free entry condition is given by:

$$\int V(z,k_0,0;\mu_t)dG(z) = w_t c_e. \tag{7}$$

[4]Entrants start with a low but non-zero level of capital to avoid numerical complications that would arise when capital is zero. Two interpretations of this assumption are that a fraction θ of entry costs can be immediately turned into capital or that paying the entry cost raises equity to begin operating.

On the other hand, we assume exit is exogenous and occurs between periods with probability γ. Our assumption is consistent with Kindsgrab (2022), who finds that corporate tax rate changes only affect entry and not exit of firms.

Given entry, exit, and firms' optimal policy functions, the evolution of the distribution $\mu(z_t, k_t, d_t)$ satisfies:[5]

$$\mu(z_{t+1}, k^*(z,k,d;\mu_t), d^*(z,k,d;\mu_t)) = (1-\gamma)\mu(z_t, k_t, d_t)F(z_{t+1}|z_t), \tag{8}$$

for $d_t > 0$ and $k_t \neq k_0$. $F(z_{t+1}|z_t)$ represents the transition probability from productivity z_t to z_{t+1}, and $k^*(z,k,d;\mu_t)$ and $d^*(z,k,d;\mu_t)$ represent, respectively, the optimal capital and deduction chosen for period $t+1$ by a firm with type (z,k,d) in period t.[6] Moreover, we have:

$$\mu(z_{t+1}, k^*(z,k_0,0;\mu_t), d^*(z,k_0,0;\mu_t)) = (1-\gamma)\left[\mu(z_t,k_0,0) + M_t G(z)\right]F(z_{t+1}|z_t), \tag{9}$$

for $d_t = 0$ and $k_t = k_0$, as entrants must be included in the transition as well. To close the model, we introduce the household and government actors.

3.2 Households

The representative household consumes, supplies labour, and invests in the creation of new firms.[7] By choosing labour supply N_t^s and consumption C_t, the household maximizes expected, discounted lifetime utility:

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left(\log C_t - \nu N_t^s\right), \tag{10}$$

subject to:

$$C_t + M_t w_t c_e = w_t N_t^s + \Pi_t + T_t, \tag{11}$$

in which Π_t represents total profits earned by firms and T_t are government transfers. Combining the first-order conditions of labour and consumption, we get the standard optimal intra-temporal condition between consumption and labour supply:

$$\nu C_t = w_t., \tag{12}$$

[5]For ease of notation, here we represent the transition in a discretized state-space, in which transition probabilities for productivity are described by a discrete Markov process, similarly to our numerical solution method. The logic is the same in continuous space.

[6]This implies $k^*(z,k,d;\mu_t) = (1-\delta)k_t + i^*(z,k,d;\mu_t)$ and $d^*(z,k,d;\mu_t) = (1-\hat{\delta})(d_t + i^*(z,k,d;\mu_t))$

[7]Alternatively, we could load the payment of entry costs directly on firms, such that the profits of entrants are lower due to the payment of entry costs. Since the household owns all firms, in the aggregate, this is the same.

3.3 Government

The government levies taxes on firms. The proceeds T_t are then transferred lump-sum to households. T_t is given by:

$$T_t = \tau \left(\underbrace{Y_t - w_t N_t}_{\text{Net revenues}} - \underbrace{\hat{\delta} \left(D_t + I_t \right)}_{\text{Tax deductions}} \right). \tag{13}$$

Y_t represents aggregate production, N_t is the total labour used in production, and D_t and I_t indicate the aggregate stock of deduction allowances and investment, respectively.

3.4 Aggregation and Market Clearing

Total labour demanded from households by firms is either used in production or to cover entry costs:

$$N_t^d = M_t c_e + N_t = M_t c_e + \int l^*(z, k, d; \mu_t) \mu(dz, dk, dd).$$

In equilibrium, labour demanded equals labour supplied:

$$N_t^d = N_t^s.$$

Total production, net of investment and total resources *dissipated* for adjustment costs (AC_t), is used for consumption by the household:

$$C_t = Y_t - I_t - AC_t = \int \left[y^*(z, k, d; \mu_t) - i^*(z, k, d; \mu_t) - \mathcal{C}^*(z, k, d; \mu_t) \right] \mu(dz, dk, dd). \tag{14}$$

Finally, total profits Π_t earned in the economy are equal to:

$$\Pi_t = \int \pi^*(z, k, d; \mu_t) \mu(dz, dk, dd),$$

in which $\pi^*(z, k, d; \mu_t)$ refers to the profit a firm earns under the optimal policy functions.

3.5 Equilibrium

In the exercises we present below, we solve for the stationary equilibrium and compare different steady-state equilibria. The steady states differ because we embed the real-world values of the corporate tax rate τ and the deduction allowance parameter $\hat{\delta}$

before and after the Dutch tax reform into the model. Given a collection of exogenous parameters, the stationary equilibrium is defined as:

(1) A distribution of firms $\bar{\mu}$ such that $\bar{\mu}(z_{t+1}, k_{t+1}, d_{t+1}) = \bar{\mu}(z_t, k_t, d_t)$, for all z, k, d.

(2) An equilibrium wage $\bar{w}$ which solves the free entry condition in (7),

(3) A mass of entrants $\bar{M}$ which solves market clearing from equation (14).

(4) A steady-state stochastic discount factor $\bar{\Lambda} = \beta$.

(5) A collection of policy functions $\bar{l^*}$ and $\bar{i^*}$, which solve the firms' maximization problem, given $\bar{\Lambda}$, $\bar{\mu}$ and $\bar{w}$,

(6) An aggregate $\bar{T}$ from (13), and $\bar{\Pi}$, $\bar{I}$, $\bar{C}$, $\bar{N}$, $\bar{N^s}$, $\bar{N^d}$ which solve the aggregation conditions in section 3.4.

4 Calibration

To quantify the effects of the corporate tax reform through the lens of our model, we calibrate the model parameters using firm-level balance sheet data from Statistics Netherlands. The dataset covers the universe of tax-paying, non-financial firms in the Netherlands over the period 2000–2004, which provides us with detailed information on pre-reform firm behaviour.

First, though, we set several parameters externally. The values we set for $\{\alpha, \beta, \gamma\}$ to match the labour share, real interest rate, and firm exit rate in the Dutch economy are displayed in the top panel of Table 1. Furthermore, we assign the economic depreciation rate δ and the persistence of the productivity process ρ^z with standard values from the literature, such as the calibration in Winberry (2021). Lastly, we use the balance sheet data of firm-level value-added, capital stock, and employment to estimate the mean and the median of the productivity distribution, following Ackerberg, Caves, and Frazer (2015). The estimation method is applied in numerous studies of firm-level productivity in the Netherlands and other countries, such as Bartelsman, Dobbelaere, and Mattioli (2024) and De Loecker, Eeckhout, and Unger (2020). We back out the two remaining AR(1) parameters, the variance σ^z and mean $\bar{z}$, by calibrating them such that the implied stationary distribution, given ρ^z, displays the observed median and mean.

The three remaining parameters $\{\psi, c_e, \nu\}$ are calibrated internally by matching two targets and imposing one normalisation. Recall, ψ represents the coefficient on the capital quadratic adjustment cost $\mathcal{C}$, which we calibrate to match the pre-reform investment to GDP ratio of 0.16. Next, to calibrate c_e (the entry cost scaled by $1/w_t$), we exploit the fact that the balance sheet data allows us to differentiate between production and non-production costs. We cannot distinguish between production and non-production labour (costs), which is the model equivalent. We acknowledge the mapping from the data to the model is imperfect, but still target the 7% ratio of non-production to total production costs to calibrate c_e. Note that c_e and ψ are jointly calibrated to match the two targets above. Lastly, ν represents the disutility of labour. By combining the household's first-order condition in equation 12 and aggregate market clearing in equation 14, ν is set such that the mass of entrants in the pre-reform steady-state is normalised to 1. You can inspect the calibrated values for $\{\psi, c_e, \nu\}$ in the bottom panel of Table 1.

Table 1: **Calibration (internal and external).**

Parameter	Description	Value	Target		
External					
α	K output elasticity	0.32	Labour share 68%		
γ	Exit rate	0.10	Annual exit rate 10%		
β	Discount factor	0.99	Real interest rate $\approx$ 1%		
δ	Depreciation	0.03	Winberry (2021)		
ρ^z	AR(1) persistance	0.90	Winberry (2021)		
σ^z	AR(1) volatility	0.36	ACF (2015) estimation		
$\log \bar{z}$	AR(1) unc. mean	-0.24	ACF (2015) estimation		
Parameter	Description	Value	Target	Model	Data
Internal					
ψ	Adjustment cost	0.05	Investment / GDP	0.15	0.16
c_e	Entry cost	8.93	Fixed / total costs	0.07	0.07
ν	Labour disutility	0.01	Mass of entrants	$M = 1$	Normalisation

Notes: This table exhibits externally and internally set parameters and indicates the moments we target in our estimation. The 'External' panel shows parameters we set externally, following values from the literature or our own productivity estimation. The 'Internal' panel displays the parameter values that result from our own calibration using the targets from the data. All data moments are measured using data from 2000 to 2004, before the tax reform.

Once calibrated, our model reproduces several untargeted moments from the data. We see in panel 1 in Table 2 that the model replicates the empirical corporate tax to GDP ratio and the effective tax rate that firms pay. Then, we also match the cross-sectional distribution of capital across firms. Our model reproduces the high Gini coefficient and share of aggregate capital held by the 0-50th, 50-95th, and 95th+ percentiles of the firm capital distribution, as shown in panels 2 and 3 in Table 2. As would be expected, our framework results in an employment distribution that is more unequal than the empirical counterpart. This is likely due to the lack of labour market frictions in our model. Lastly, our model replicates the empirical pattern that the investment rate (investment over capital) decreases with firm size. Due to the mean-reversion of the productivity process in our model, smaller firms expect to receive more favourable productivity shocks, so they invest more. Larger firms invest only to maintain their size, not to grow.

Table 2: **Untargeted moments of the pre-reform economy.**

Panel 1	Corp. tax to GDP ratio	Effective tax rate	
Data	0.05	0.18	
Model	0.04	0.15	
Panel 2	Capital	Employment	
Gini			
Data	0.95	0.84	
Model	0.92	0.91	
Panel 3	Share of agg. capital	Share of agg. empl.	Average inv. rate
Top (95 pct.)			
Data	88.47	69.25	0.11
Model	81.43	91.78	0.08
Middle (50-95 pct.)			
Data	10.82	26.41	0.20
Model	17.52	4.19	0.35
Bottom (0-50 pct.)			
Data	0.71	4.35	0.26
Model	0.01	4.02	0.98

Notes: *Panel 1* exhibits the data and model moments of the tax-to-GDP ratio (taxes paid / sum of value-added) and the effective tax rate (taxes paid / taxable income before investment deductions). *Panel 2* exhibits the data and model moments for the cross-sectional Gini measure of inequality base on capital, first column, and employment, second column. *Panel 3* exhibits several measures of the firm distribution for capital, labour, and the investment rate (investment over capital). The 'Top (95 pct.)' sub-panel exhibits the share of aggregate capital and employment held by and the average investment rate (i/k) for the largest 5% of firms. The same applies to the 'Middle (50-95 pct.)' and 'Bottom (0-50 pct.)' sub-panels. The firm size bins are based on capital. All data moments are measured using data from 2000 to 2004, before the tax reform.

5 Quantitative Results

With the calibrated model, we next investigate how the reallocation of resources from the losers to the winners of the tax reform leads to changes in allocative efficiency. We then examine what types of firms are the winners and losers of the reform. Operationally, we estimate and compare four different long-run steady states of the economy: the pre-reform economy, the post-reform economy, and two counterfactual versions of the economy in which only the tax rate τ or only the deductibility parameters $\hat{\delta}$ is adjusted. The four sets of tax parameters for each equilibrium are presented in panel 1 of Table 3.

We evaluate allocative efficiency through two complementary lenses: i) misallocation, measured as the cross-sectional variance in the logarithm of the marginal product of capital, as in Hsieh and Klenow (2009); and ii) aggregate productivity, defined as the Solow residual of aggregate output. Concretely, the misallocation of capital is defined as:

$$\mathrm{M}_k \equiv \mathrm{Var}\left(\log\left(\alpha z k^{\alpha-1} l^{1-\alpha}\right)\right). \tag{15}$$

If taxes and investment frictions were absent from our model, there would be no dispersion in marginal products across firms because all firms face the same input prices. However, in our model, firms over- or under-invest relative to the frictionless benchmark, resulting in the misallocation of resources and the dispersion of marginal products. For example, in a frictionless environment, a small firm would scale up following a favourable productivity shock. In our case, the convex adjustment could make the cost of scaling up prohibitive, and so the firm stays below its optimal size and its marginal product of capital remains too high.

Next, aggregate productivity is defined as the Solow residual of aggregate output:

$$Z \equiv \frac{Y}{K^{\alpha} L^{1-\alpha}} \tag{16}$$

in which $Y = \int y^*(z,k,d;\mu)\,\mu(dz,dk,dd)$, $K = \int k^*(z,k,d;\mu)\,\mu(dz,dk,dd)$, and $L = \int l^*(z,k,d;\mu)\,\mu(dz,dk,dd)$. Since we assume the stationary productivity distribution $G(z)$ does not change across steady states, any changes in aggregate productivity reflect resources moving towards more or less productive firms. Panel 2 in Table 3 highlights that the full reform raises aggregate productivity by 1.3%, and reduces capital misallocation by 4.3%, relative to the pre-reform benchmark.

In the last two columns of Panel 2 in Table 3, you can see that the deductibility cut alone raises productivity by 1.1% and reduces capital misallocation by 2.9%, accounting for the bulk of the aggregate effect in the full reform. The rate cut by itself has a negligible direct effect on productivity (-0.0%) and modestly reduces capital misallocation (-2.0%). Our model suggests the base-broadening element of the reform, not the rate cut, is primarily responsible for improved allocative efficiency. Moreover, adding the separate effects of each counterfactual together, we get a number relatively close to the effect of the full reform. Therefore, spillovers between the two levers of the reform appear to be second-order.

Table 3: **Baseline exercise; percentage change relative to the pre-reform economy.**

Panel 1		Corporate tax rate (τ)	Deduction allowance ($\hat{\delta}$)
Pre-reform		0.345	1
Post-reform		0.255	0.2
Tax-only		0.255	1
Deduction-only		0.345	0.2
Panel 2	Post-reform	Tax-only	Deduction-only
Aggregate productivity	1.3	-0.0	1.1
Capital misallocation	-4.3	-2.0	-2.9

Notes: *Panel 1* displays the values for the corporate tax rate τ and tax deduction parameter $\hat{\delta}$ in each of the four long-run equilibria. They correspond to the pre- and post-reform Dutch parameters and two steady-states in which we vary only τ or $\hat{\delta}$. *Panel 2* shows the percentage change in aggregate productivity and capital misallocation, relative to the Pre-reform steady-state, for each of the other long-run equilibria.

Before turning to the model mechanisms behind the allocative efficiency gains, we examine how the policy change reallocates capital across firms of different sizes and productivity levels. The reallocation is the key channel through which the efficiency improvements arise. Ideally, to illustrate the redistribution of capital, we would track how firms at each percentile of the size distribution in the pre-reform economy fare after the policy change. However, since we compare distinct steady states, we instead split firms into three bins based on their capital stock size and compare the share of aggregate capital held by each group across the equilibria. The binning method provides equivalent insights into the reallocation of capital.

Figure 1a groups firms into the smallest 50%, the largest 5%, and the remainder ('medium-large' firms). Each bar indicates by how much the share of aggregate capital held by firms in each size bin changes relative to the pre-reform economy. In all three tax regimes, almost all of the reallocation of aggregate capital occurs between medium-large firms and the largest 5%. The largest 5% see their share of aggregate capital increase by 2.2pp after the full reform. Medium-large firms lose nearly all of that share. In the Tax-only reform, the reallocation effect is more muted (+0.6pp) compared to the Deduction-only reform (+1.1pp).

Figure 1b replicates the reallocation analysis, now sorting firms into productivity bins. The top 5% most productive firms see their share of aggregate capital increase by 1.5pp in the full reform, 0.7pp in the Deduction-only counterfactual, and 0.3pp in the Tax-only counterfactual. The reallocation of capital towards the largest and most productive firms contributes to the reduced capital misallocation and higher aggregate productivity exhibited in Table 3.

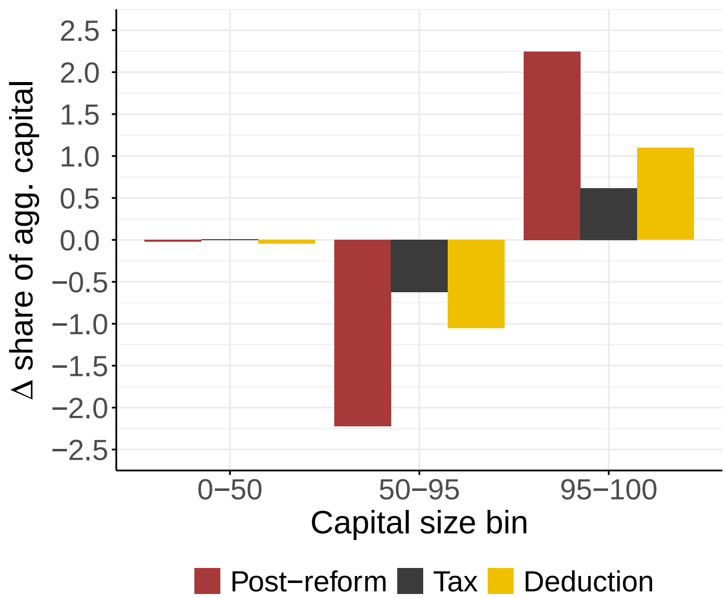
5.1 Mechanisms Behind the Reallocation

What explains the reallocation of capital toward top firms under the tax policy changes? The full reform activates two reinforcing mechanisms in our model that drive capital toward the largest and most productive firms. First, the lower tax rate increases after-tax profits for all firms. The largest windfall gains go to the most profitable firms, which, in our model, also tend to be the largest and most productive. Concretely, in the pre-reform economy, the Spearman correlation between the percentile ranks of profit and productivity and profit and capital are 0.285 (standard error 0.004) and 0.250 (0.013), respectively. As a result, the reform disproportionately benefits these top firms.

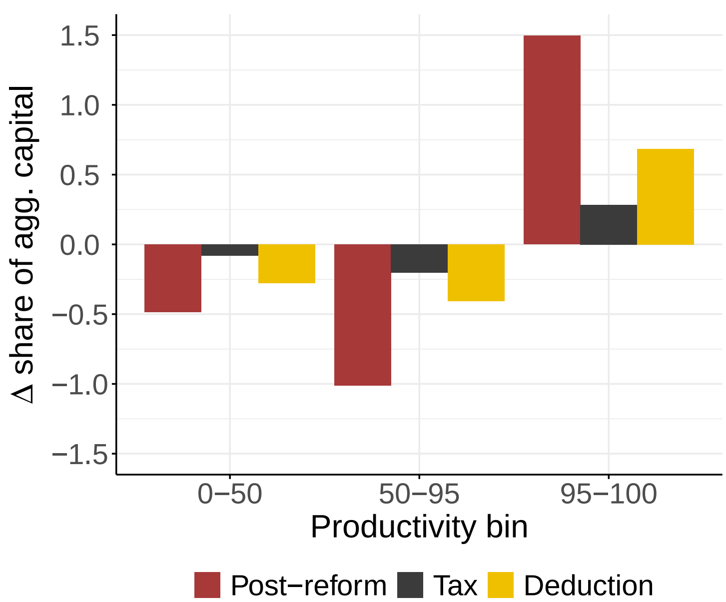
A lower deduction allowance reduces all firms' tax shield and delays the tax benefits of investment. Medium-large firms, whose growth strategies rely on aggressive capital investment, are disproportionately burdened by the reduction in investment tax benefits. Recall from Table 2, medium-large firms invest more intensively than the top 5% largest firms. In the pre-reform economy, the average investment rate for medium-large firms is 35%, compared to just 8% for the largest firms, who invest primarily to maintain their existing scale. Therefore, the deduction cut leads medium-large firms to retrench by reducing their capital investment relative to the top 5%.

5.2 Budget-Neutral Reform

Before this section, we studied the effects of a targeted corporate tax policy change. Although the investment deduction was intended to offset the revenue loss from the rate cut, we did not impose budget neutrality in our simulations. This choice might affect our results: since we start from a distorted second-best equilibrium, any change in



(a)



(b)

Figure 1: (a) The change in the share of aggregate capital held by the smallest 50%, middle $50-95\%$, and top 5% largest firms based on their capital stock, relative to the pre-reform economy. (b) Change in the share of aggregate capital held by the least 50%, middle $50-95\%$, and top 5% most productive firms, relative to the pre-reform economy.

tax revenue may affect aggregate welfare, consumption, and the distribution of capital across firms. In this section, we implement a budget-neutral reform, which nullifies any effect of tax revenue changes. In addition, the exercise allows us to cross-validate our model's tax revenue predictions.

To implement the budget-neutral reform, we conduct the following experiment. Imagine the goal of the government is still to impose the same tax rate cut as in the full reform, and call the lower tax rate τ^L. Then, to what value does the deduction parameter $\hat{\delta}$ need to be set to keep the tax revenues the same as in the pre-reform steady state? Call that value of tax revenue T_t^L. Formally, from the government budget constraint, we find a new value $\hat{\delta}^L$ such that:

$$T_t^L = \tau^L \left(Y_t - w_t N_t - \hat{\delta}^L \left(D_t + I_t \right) \right), \tag{17}$$

A value of $\hat{\delta}^L = 0.24$ satisfies equation 17. $\hat{\delta}^L$ is only slightly higher than the actual $\hat{\delta} = 0.20$ which was implemented. First, that finding confirms the validity of our theoretical and quantitative framework in matching the actual trade-offs that Dutch policymakers faced. Second, the changes in misallocation and aggregate productivity in the budget-neutral reform are very similar to those in the full reform. As shown in Table 4, capital misallocation declines by 3.9% instead of 4.3%, and aggregate productivity increases by 0.9% rather than 1.3%.

Table 4: **Percentage changes in the full reform and the budget-neutral reform.**

Variable	Post-reform	Budget-neutral reform
Aggregate productivity	1.3	0.9
Capital misallocation	−4.3	−3.9

Notes: This table displays the percentage change in aggregate productivity and capital misallocation, relative to the pre-reform steady-state, for the full reform and the budget-neutral reform.

6 Conclusion

Why and towards which firms does capital reallocate after a corporate tax reform? And how does the redistribution affect allocative efficiency? We test the effects of a lower tax rate coupled with reduced investment deductibility in a heterogeneous firm model to answer these questions. Our model predicts that aggregate productivity increases by 1.3% and capital misallocation declines by 4.3%. Allocative efficiency improves as a result of the reallocation of capital towards the largest and most productive firms, and away from medium-large firms. On the one hand, the lower tax rate generates the largest after-tax windfall gains for the most profitable (the largest and most productive) firms, allowing them to expand. On the other hand, the lower tax deductibility represents a cost for all firms, but because medium-large firms invest aggressively relative to their size, they experience the largest drop in investment and capital. We show that our results are robust in an alternative experiment in which we constrain the reform to be budget neutral.

Our findings have implications for a broader corporate tax debate about the design of budget-neutral policies (OECD, 2010). Is a low-rate-low-deduction or a high-rate-high-deduction tax environment best for growth? While we do not analyse growth directly, from an allocative efficiency perspective, our results suggest that lowering tax rates and broadening firms' tax base redirects capital toward productive and large firms. At the same time, though, the tax policy we consider places relatively greater burdens on medium-sized firms that rely on the tax benefits of investment, a trade-off policymakers must carefully consider.

References

Ackerberg, D. A., Caves, K., & Frazer, G. (2015). Identification Properties of Recent Production Function Estimators. *Econometrica*, *83*(6), 2411–2451.

Baley, I., & Blanco, A. (2022). The Long-Run Effects of Corporate Tax Reforms. *CEPR Discussion Paper No. DP16936*.

Bartelsman, E., Dobbelaere, S., & Mattioli, A. Z. (2024). Non-compete Agreements, Tacit Knowledge and Market Imperfections. *IZA Discussion Paper Series*, *17260*.

Becker, B., Jacob, M., & Jacob, M. (2013). Payout Taxes and the Allocation of Investment. *Journal of Financial Economics*, *107*(1), 1–24.

Bilicka, K., Güçeri, I., & Koumanakos, E. (2025). Dividend Taxation and Firm Performance with Heterogeneous Payout Responses. *American Economic Journal: Economic Policy*, *17*(2), 1–29.

Campbell, J. L., Chyz, J. A., Dhaliwal, D. S., & Schwartz Jr, W. C. (2013). Did the 2003 Tax Act Increase Capital Investments by Corporations? *The Journal of the American Taxation Association*, *35*(2), 33–63.

Chodorow-Reich, G. (2025). *The Neoclassical Theory of Firm Investment and Taxes: A Reassessment* (Tech. Rep.). National Bureau of Economic Research.

Chodorow-Reich, G., Smith, M., Zidar, O. M., & Zwick, E. (2024). *Tax Policy and Investment in a Global Economy* (Tech. Rep.). National Bureau of Economic Research.

Chodorow-Reich, G., Zidar, O., & Zwick, E. (2024). Lessons from the Biggest Business Tax Cut in US History. *Journal of Economic Perspectives*, *38*(3), 61–88.

Clementi, G. L., & Palazzo, B. (2016). Entry, Exit, Firm Dynamics, and Aggregate Fluctuations. *American Economic Journal: Macroeconomics*, *8*(3), 1–41.

Colciago, A., Lewis, V., & Matyska, B. (2024). Corporate Taxes, Productivity, and Business Dynamism. *CEPR Discussion Paper*.

Cooper, R., & Haltiwanger, J. (2006). On the Nature of Capital Adjustment Costs. *The Review of Economic Studies*, *73*(3), 611–633.

Cooper, R., Haltiwanger, J., & Power, L. (1999). Machine Replacement and the Business Cycle: Lumps and Bumps. *American Economic Review*, *89*(4), 921–946.

De Loecker, J., Eeckhout, J., & Unger, G. (2020). The Rise of Market Power and the Macroeconomic Implications. *The Quarterly Journal of Economics*, *135*(2), 561–644.

Eerste Kamer. (2006). *Wet Werken aan Winst (30.572).* https://www.eerstekamer.nl/wetsvoorstel/30572_wet_werken_aan_winst.

Erosa, A., & González, B. (2019). Taxation and the Life Cycle of Firms. *Journal of Monetary Economics*, *105*, 114–130.

Furno, F. (2021). The Macroeconomic Effects of Corporate Tax Reforms. *Unpublished Working Paper*.

Hopenhayn, H., & Rogerson, R. (1993). Job Turnover and Policy Evaluation: A General Equilibrium Analysis. *Journal of political Economy*, *101*(5), 915–938.

Hsieh, C.-T., & Klenow, P. J. (2009). Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics*, *124*(4), 1403–1448.

Kindsgrab, P. M. (2022). Empirical Evidence on the Effect of Local Business Taxes on Business Entry. *Unpublished Working Paper*.

Lichter, A., Löffler, M., Isphording, I. E., Nguyen, T.-V., Poege, F., & Siegloch, S. (2025). Profit Taxation, R&D Spending, and Innovation. *American Economic Journal: Economic Policy*, *17*(1), 432–463.
Link, S., Menkhoff, M., Peichl, A., & Schüle, P. (2023). Downward Revision of Investment Decisions after Corporate Tax Hikes. *IZA Discussion Paper*.
OECD. (2010). *Choosing a Broad Base - Low Rate Approach to Taxation* (Tech. Rep. No. 19). Paris: OECD Publishing.
Ohrn, E. (2018). The Effect of Corporate Taxation on Investment and Financial Policy: Evidence from the DPAD. *American Economic Journal: Economic Policy*, *10*(2), 272–301.
Sedláček, P., & Sterk, V. (2019). Reviving American Entrepreneurship? Tax Reform and Business Dynamism. *Journal of Monetary Economics*, *105*, 94–108.
Tweede Kamer der Staten-Generaal. (2006). *Wijziging van Belastingwetten Ter Realisering van de Doelstelling Uit de Nota «Werken aan Winst» (Wet werken aan Winst)* (Tech. Rep. No. 30572.3).
Winberry, T. (2021). Lumpy Investment, Business Cycles, and Stimulus Policy. *American Economic Review*, *111*(1), 364–396.
Yagan, D. (2015). Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut. *American Economic Review*, *105*(12), 3531–3563.
Zwick, E., & Mahon, J. (2017). Tax Policy and Heterogeneous Investment Behavior. *American Economic Review*, *107*(1), 217–248.