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Abstract

We revisit the classical result that in a closed economy the incidence of corporate taxes on labor is approximately zero. We consider a rich general equilibrium framework, where agents differ in the level of their wealth as well as in their managerial and working ability. Potential entrepreneurs go through all the key decisions affected by corporate tax changes: the choice of (i) occupation, (ii) organizational form, (iii) investment, and (iv) financing structure. We allow both for the presence of financial frictions and the traditional tax advantage of debt over corporate equity, which jointly generate misallocation of capital and talent. In this environment we characterize the effects of increasing corporate taxes both analytically and for a calibrated version of the model. We show that this tax increase reallocates production from C corporations to pass-through businesses. Since, due to distorted prices, the latter have higher capital-labor ratios, this reallocation generates a reduction in labor productivity and wages. Furthermore, the corporate tax increase induces some C corporations to reorganize as pass-throughs, which implies more restricted access to external funds and thus a socially inefficient downsizing of production in these firms. Finally, the tax increase causes further misallocation of talent by inducing agents with low wealth relative to their managerial talent to switch from entrepreneurship to being workers, while the reverse happens for agents with higher wealth and lower managerial skills. Overall, we find that both labor and capital bear a large share of the corporate tax incidence, while entrepreneurs are net beneficiaries of the tax change.

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Tax Wedges, Financial Frictions and Misallocation

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Abstract

We revisit the classical result that in a closed economy the incidence of corporate taxes on labor is approximately zero. We consider a rich general equilibrium framework, where agents differ in the level of their wealth as well as in their managerial and working ability. Potential entrepreneurs go through all the key decisions affected by corporate tax changes: the choice of (i) occupation, (ii) organizational form, (iii) investment, and (iv) financing structure. We allow both for the presence of financial frictions and the traditional tax advantage of debt over corporate equity, which jointly generate misallocation of capital and talent. In this environment we characterize the effects of increasing corporate taxes both analytically and for a calibrated version of the model. We show that this tax increase reallocates production from C corporations to pass-through businesses. Since, due to distorted prices, the latter have higher capital-labor ratios, this reallocation generates a reduction in labor productivity and wages. Furthermore, the corporate tax increase induces some C corporations to reorganize as pass-throughs, which implies more restricted access to external funds and thus a socially inefficient downsizing of production in these firms. Finally, the tax increase causes further misallocation of talent by inducing agents with low wealth relative to their managerial talent to switch from entrepreneurship to being workers, while the reverse happens for agents with higher wealth and lower managerial skills. Overall, we find that both labor and capital bear a large share of the corporate tax incidence, while entrepreneurs are net beneficiaries of the tax change.

JEL Classifications: E62, G11, G32, H21, H22, H25

Keywords: Corporate Taxation, Tax Incidence, Heterogeneous Agents, General Equilibrium

1 Introduction

The "Tax Cuts and Jobs Act 2017" (TCJA) constitutes one of the most substantial reforms to U.S. tax law in recent history. One of its key features is a cut in the federal statutory corporate tax rate from 35 to 21 percent, following more than three decades during which this rate was left mostly unchanged. The Biden administration plans to partially reverse several elements of this reform, including an increase in the corporate tax rate back to 28 percent. Given these large shifts, the appropriate taxation of corporate income has received much attention recently.

The political discussion centers around an efficiency–equity tradeoff, the conventional wisdom being that higher corporate tax rates reduce output but also inequality. Indeed, in a seminal paper Harberger (1962) finds that in a static closed economy with fixed factor supplies approximately 100 percent of the incidence of the corporate tax falls on capital while the incidence on labor is approximately zero. This implies that none of the economic burden of corporate taxes would fall on the poorer half of U.S. individuals who in the data do not earn any capital income. Auerbach (2018) summarizes the state of the literature as "[w]ith some modifications, the influence of Harberger's (1962) basic approach continues" (Auerbach, 2018, p.99).[1] Until today, many empirical studies assume "as a reasonable first approximation" (Piketty, Saez and Zucman, 2018, p.569) that labor bears none of the corporate tax incidence. Yet, this assumption has important implications on the conclusions drawn from these studies, in particular with regards to the distributional consequences of corporate tax changes (Piketty and Saez, 2007; Piketty, Saez and Zucman, 2018).

However, the environment in which this result was derived does not account for two features that are relevant for the analysis of corporate taxation. First of all, entrepreneurs face financial frictions when they decide on entry, on their organizational form, on investment, and on their financing structure. Second, the choice of firms' organizational form (C corporation or pass-through) reflects that the two forms differ in their tax treatment and associated financing constraints. Our paper shows, mostly analytically, how these features affect the incidence of corporate taxation.

The Framework. Our tractable general equilibrium framework, to the best of our knowledge, is the first to jointly consider and endogenize the following key decisions affected by corporate tax changes: (i) occupational choice (being a worker or entrepreneur), (ii) firms' organizational form (pass-through or C corporation), (iii) investment, and (iv) financing (inside equity, debt, outside equity). For comparability and tractability, we consider a static and closed economy with fixed supply of capital

[1] He attributes the fact that in 2012 the Congressional Budget Office increased the share of corporate tax incidence it imputes on labor from zero to 25 percent to the consideration of international capital flows and studies of corporate tax incidence in open economies, which have different predictions than Harberger's analysis of a closed economy. Similarly, he explains the findings of recent quasi-experimental studies (e.g. Suarez-Serrato and Zidar, 2016; Fuest, Peichl and Siegloch, 2018) that local business taxes significantly affect wages with high capital mobility within countries.

and a fixed population as in Harberger (1962). These modeling choices clearly affect our quantitative findings. However, the mechanisms we identify will be present in more complex dynamic and stochastic environments and hence provide a very useful step in understanding what determines the incidence and distributional consequences of corporate taxes.

In our model, all entrepreneurs have access to a constant returns to scale production technology that combines capital, labor and managerial ability. Managerial ability is a fixed characteristic of the (potential) entrepreneur. To finance their investment, firms can use debt, subject to an equity-based collateral constraint. In addition, if a firm is a C corporation it can also raise funds by issuing outside equity. All firms produce the same good, and entrepreneurs optimally choose their organizational form and financing structure given the financial frictions they face.

As in Harberger's analysis, there are two types of firms in our framework, C corporations and pass-throughs, where only the formers' profits are subject to corporate taxes. However, our modeling of these firm types differs in several crucial ways.

First, we consider a realistic specification of the tax system.[2] In the U.S., profits of pass-through businesses enjoy preferential tax treatment over profits from C corporations, since at least the Reagan era. Specifically, personal income taxes, which apply to the profits of pass-throughs, are significantly lower than effective taxes on C corporation profits, which consist of corporate income and dividend taxes. This differential tax treatment benefits pass-throughs unless C corporations are fully debt financed.[3] Indeed, the share of business income generated by pass-throughs in the US increased from less than 20 percent in 1980 to more than 50 percent today (Auerbach, 2018), and the preferential tax treatment of pass-throughs significantly contributed to this trend (Auerbach and Slemrod, 1997; Dyrda and Pugsley, 2019; Smith, Yagan, Zidar and Zwick, 2019, 2022). Given this evidence, allowing potential entrepreneurs to endogenously choose their organizational form is important for the analysis of corporate tax rate changes.

Second, another significant difference between pass-throughs and C corporations is that organizing a firm as a pass-through restricts the number of shareholders, while C corporations can have an arbitrary number of owners. This distinction generates differences in the amount of funds available for investment, since C corporations can decide to issue publicly traded outside equity while pass-throughs cannot. In practice,

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[2] Harberger (1962) introduces an infinitesimal corporate tax in a laissez-faire economy, implying that the allocation is efficient. By contrast, in our economy, such tax changes may cause changes in the tax system's deadweight loss. The importance of accounting for changes in the deadweight loss in incidence analysis is emphasized, e.g., in Fullerton and Metcalf (2002) and Auerbach (2018).

[3] Note that this tax advantage is present even post-TCJA, as the reduction in the corporate tax rate was accompanied by a 20% tax deduction on pass-through businesses.

depending on the precise legal form of the pass-through,[4] the number of shareholders is restricted between one (sole proprietorship) and 100 shareholders (S-corporation). We abstract from these pass-through subtypes and assume that the business founder is the only shareholder in a pass-through entity, while C corporations can issue outside equity and have arbitrarily many shareholders. As in reality, in our environment C corporations face higher costs not only due to higher taxes on profits but also because of additional costs of incorporation and equity issuance. Therefore, the firms' choice of organizational form is governed by the trade-off between the greater availability of funds and the higher costs and taxes of C corporations.

Aside from different tax treatment and financing forms, in the US the universe of pass-through businesses has become very similar to the one of C corporations. In fact, this similarity has reached a level such that empirical studies can exploit tax changes to only one of these legal types as natural experiments with the other type serving as control group (Yagan, 2015). For these reasons we make the simplifying assumption that all firms produce the same goods.

In our model, agents sort into occupations based on their relative ability as workers and entrepreneurs as well as based on their initial wealth. Hence, contrary to most existing studies on tax incidence, our model features rich heterogeneity in income and wealth. This allows us to track the incidence of corporate taxes not only on production factors, but also on each individual agent. An important feature of our framework is that we can clearly differentiate between workers (employees) and entrepreneurs as they enter the production function as different inputs. This is key because one of the important consequences of corporate tax changes is the redistribution between workers and entrepreneurs as well as across pass-through and C corporation entrepreneurs.

The Mechanisms. Our main experiment is a marginal increase in the effective corporate tax rate. This increases the cost of capital in C corporations, reducing their demand for capital. To restore equilibrium in the capital market, the interest rate must decline and some unconstrained pass-throughs (whose investment level is not affected by the collateral constraint) absorb the capital released from C corporations. Since capital and labor are complements, this also generates a reallocation of labor from C corporations to pass-throughs. Whether workers share some of the tax burden hinges crucially on whether this reallocation of factors has a first-order effect on labor productivity and wages. In turn, the decline in wages depends on the relative factor demand in pass-throughs and C corporations.

To see this, we first consider the frictionless benchmark, where C corporations face no issuance and incorporation costs and there is no tax advantage for pass-throughs. In this case, the equilibrium is efficient, and firms' input decisions and size is solely a function of managerial ability. In this special case, the burden of the corporate tax

[4] U.S. law distinguishes partnerships, sole proprietorships, limited liability companies and S-corporations.

increase falls fully on capital owners.[5] When capital and labor are reallocated from C corporations to pass-throughs as a response to an infinitesimal increase in corporate taxes, wages and aggregate production are unchanged because marginal products and capital–labor ratios are equal in both types of firms. Furthermore, the increase in the tax wedge raises the financing costs of C corporations. In equilibrium, this leads to a decline in the interest rate, and hence a reduction in the the financing costs of pass-through businesses. This induces redistribution from owner-managers of C corporations towards owner-managers of pass-throughs. The incidence on the managerial sector as a whole is zero.

In the more realistic case with an existing tax wedge and financial frictions, there is misallocation of production factors. Specifically, for a given level of entrepreneurial ability of owner-managers, C corporations employ less capital and less labor than unconstrained pass-throughs. Furthermore, a positive mass of firms operate as constrained pass-throughs, at a lower scale than unconstrained pass-throughs. Finally, the difference in financing costs implies different relative prices of capital and labor. In particular, the relative price of labor is lower for C corporations, who are thus more labor-intensive than unconstrained pass-throughs.

Starting from such an equilibrium, as the increase in corporate taxes triggers a further decline in the factor demand of C corporations, pass-throughs do not absorb the released labor in the same proportion as the released capital. To restore equilibrium in the labor market (keeping occupational choice fixed) wages must fall. Thus, even in the absence of occupational or organizational switches, some of the corporate tax incidence falls on labor. Importantly, this drop in wages lowers labor expenses, benefiting entrepreneurs. Therefore, the increased corporate tax rate has a beneficial effect on the managerial sector—hence, the joint burden on capital and labor exceeds 100 percent.

When we allow for the endogenous choice of the organizational form of firms, the above effect is reinforced: in response to the tax increase, some entrepreneurs change the organizational form of their business from C corporation to constrained pass-through. This results in a discrete reduction in labor demand as these businesses can no longer access external equity and hence operate on a smaller scale. Furthermore, some agents at the margin between employment and entrepreneurship change their occupation. Some agents with low wealth, relative to their productivity, who rely on outside equity issuances when operating a C corporation, no longer find it worthwhile to do so and become workers instead. This effect reduces net labor demand and drives down wages further. Some other agents with relatively high wealth, who do not need outside equity, switch from employment to running a pass-through as a result of the lower factor prices, a force that operates in the opposite direction as it increases labor demand.

[5] In Harberger (1962) capital may theoretically bear more or less than 100% of the corporate tax incidence as it is assumed that corporate and non-corporate firms produce different goods with potentially different labor intensities. We abstract from this mechanism since (i) as described above, nowadays C corporations and pass-throughs are quite similar in terms of the industries they operate in, and (ii) even in Harberger's analysis, the quantitative effect of this heterogeneity is limited.

A benefit of our tractable approach is that we are able to provide analytical expressions for all these effects. In addition, we also provide a quantification in a calibrated model.

Main Results. Our model's main predictions are in stark contrast with the classical results in the literature. In our calibration, the presence of an initial tax wedge and financial frictions, as well as endogenous organizational form and occupation choices, are quantitatively important. In particular, 84 percent of the corporate tax incidence falls on labor. As the incidence on capital is similarly high, capital and labor together bear 167% of the corporate tax incidence, while the incidence share on the entrepreneurial input of owner-managers is negative (-67%). In other words, on average, entrepreneurs gain from the corporate tax increase. However, this aggregate effect on managerial income is not homogeneous across business owners. C corporations' owners experience a direct increase in their cost of capital. As this effect dominates the equilibrium reduction in factor prices, they lose on net as in the frictionless benchmark. At the same time, pass-through owners benefit from the corporate tax hike as their production costs drop. Compared to the frictionless case, the wage drop amplifies their gain.

Decomposing the adverse effect of corporate tax increases on wages reveals that more than 90% of this change can be explained by reallocation of capital and labor along the intensive margin, from continuing C corporations to continuing (unconstrained) pass-throughs. Furthermore, close to 10% of the wage decline is due to the reduced factor demand of firms that switch their organizational form in response to the tax increase. Finally, the net contribution of occupational changes to the wage decline is negligible. While the switch of agents from running a C corporation to working reduces labor demand, the switch from working to running a pass-through business increases labor demand. While each of these two effects is significant, they roughly offset each other.

Related Literature. Our paper combines insights from the macroeconomics, public finance and corporate finance literature. It draws from the macroeconomics literature the richness in agents' heterogeneity that allows to study distributional consequences of tax reforms as well as the general equilibrium structure. Recently, there has been renewed interest in the taxation of corporations in frameworks where the ownership structure of firms is explicitly modeled; see the seminal contributions of Quadrini (2000) and Cagetti and De Nardi (2006). Contrary to the present model, these frameworks are generally dynamic, allowing for tax changes to affect capital accumulation. On the other hand, they abstract from several key decisions such as the organizational form and the financing structure, which we find to be crucial. Dyrda and Pugsley (2019) endogenize the choice of the firms' organizational form but not the agents' occupational choice,[6] while the converse is true for Bhandari and McGrattan (2021).[7] Neither of these papers endogenizes the firms' financial structure.

Several recent contributions explicitly model the firms' life-cycle and study the effects of corporate-, dividend-, or capital gains taxes on investment (Gurio and Miao, 2011; Anagnostopoulos, Carceles-Poveda and Lin, 2012; Erosa and Gonzales, 2019; Sedlacek and Sterk, 2019). All of these studies abstract from pass-through businesses.

It is well established in the corporate finance literature that firms' value is independent of its capital structure only under tax-neutrality of debt and equity financing (Modigliani and Miller, 1958, 1963). However, in the U.S., there is a substantial tax advantage of debt over equity financing (Miller, 1977; Graham, 2000; Hennessy and Whited, 2005). These tax differentials have been shown empirically to create large deadweight losses by preventing firms from incorporating or making them shift out of the corporate sector (Mackie-Mason and Gordon, 1997).

The theoretical literature on corporate tax incidence has been rather silent recently and we refer the reader to Gravelle (2013) for a comprehensive review of earlier studies.[8] Our framework is most closely related to the one of Gravelle and Kotlikoff (1989), who also allow for managerial inputs in production and occupational choice. However, we differ from their framework by endogenizing firms' financial structure, and by allowing for realistic financial frictions. These features affect not only the intensive margin of investment, they also imply that organizational and occupational choices depend on wealth. In turn, they interact with the tax wedge, and crucially affect the incidence of the corporate tax across the population.

2 Model

Our framework captures several dimensions that are important for the allocation of capital and talent across firms and, consequently, for the incidence of corporate taxes. In our model, agents with different wealth and ability decide first whether they want to be a worker or an entrepreneur. Next, entrepreneurs decide the legal form of their firm (pass-through or C corporation), taking financial frictions and differential tax treatment into account. Finally, all firms choose their investment level and their financing structure, determining the optimal combination of inside equity, debt and outside equity. The main objective of the framework is to obtain sharp analytical insights on the main trade-offs affecting these choice. Hence, to keep the model tractable, we restrict

[6] We became aware that in follow-up work, which is in progress, they study tax design in this environment.

[7] A very recent working paper that endogenizes both is Di Nola, Kocharov, Scholl, Tkhir and Wang (2022). Their focus, however, is different, as they study the effects of changing top income tax rates in the presence of tax avoidance.

[8] Gravelle (2013) reviews both studies that consider closed as well as open economy environments, reaching a similar conclusion as the one by Auerbach (2018) cited above.

our attention to a static environment. In Section 4.3 we will briefly dynamics.

2.1 Set-Up

Demographics. There is a continuum of agents of measure one, who differ with respect to their initial wealth a, managerial ability θ, and working ability ν. The joint distribution of these variables in the population is denoted by $\Gamma(a, \theta, \nu)$, and assumed to be continuous. The corresponding density is denoted by γ.

Preferences. All agents have the same preferences over consumption, described by the utility function $u(c)$ that is strictly increasing, $u'(c) > 0$. Since the framework is static and riskfree, each agent maximizes (after-tax) income. On this basis, she chooses whether to become a worker or an entrepreneur, and also the legal form and production inputs in the latter case.

Technology. Each agent has access to the same technology described by the production function $F(k, l, m)$, which she can use if she chooses to become an entrepreneur, that is the owner-manager of a firm. The production factors are capital k, labor l, and managerial input m. The latter is equal to the managerial talent of the entrepreneur, $m = \theta$. The production function exhibits constant returns to scale in all three inputs and satisfies standard monotonicity and concavity properties: for all $x \neq y \in \{k, l, m\}$ we have $F_x > 0$, $F_{xx} < 0$, and $F_{xy} > 0$.

Legal form of firms. There are two possible organizational forms of firms. The entrepreneur can decide whether to run her business as a pass-through or as a C corporation. We assume, based upon the US legal framework, that these two organizational forms differ in two main respects.[9] First, returns on equity from pass-through businesses are subject to personal income taxes, while those from C corporations are subject to both corporate and dividend taxes.[10] Second, it is much easier for C corporations than for pass-throughs to issue outside equity, since C corporations do not face restrictions on the number of shareholders while pass-through entities do. To capture this in a stark way, in our model we assume that pass-throughs are unable to raise any funds in the form of outside equity.

Financial Frictions. All firms can use the entrepreneur's own assets a and debt to fund their investment in capital k. We assume that both pass-throughs and C corporations are constrained in the amount of debt they can issue. Specifically, all firms must finance

[9] The differences in tax treatment and financing constraints between distinct legal forms of firms vary across countries. We have chosen to build the model following the situation in the US both to allow for a clearer relationship with the previous literature (see e.g. Harberger (1962) or more recently Dyrda and Pugsley, 2019) and because of greater data availability on firms choosing these two organizational forms. Nevertheless, the specification and analysis of our model can be easily adjusted to account for different tax systems and financial arrangements.

[10] In the US tax system, the owners of pass-through firms are subject to personal income taxes independently of whether the income generated by their firm is reported as business income or managerial salary.

at least a share $\lambda > 0$ of their capital stock with equity e,

$$e \geq \lambda k(a, \theta, \nu). \quad (1)$$

We can view this constraint as reflecting the imperfect pledgeability of future output. Only C corporations can issue outside equity (e^o) to external investors. Outside equity entails a linear equity issuance cost $\mu r e^o$, where r denotes the equilibrium interest rate, or equivalently the cost of debt financing.[11] Note that issuing outside equity not only brings in more resources directly, but also indirectly as it allows to relax the firm's borrowing constraint (1). Furthermore, C corporations must pay a fixed incorporation cost $\kappa > 0$ to operate.

Taxes. In line with the US tax code, all wage income, business income from pass-throughs, and interest income on bonds is subject to a personal income tax τ_i, while dividend income is subject to a dividend tax τ_d. Furthermore, C corporations pay a corporate tax τ_c on their profits. To determine the latter, all wages, including the compensation paid to the entrepreneur for managing the firm, as well as interest on debt, are deductable from the the firm's revenue. We assume for tractability that all taxes are linear; i.e., τ_i, τ_d, τ_c are constant. In total, profits of C corporations are taxed at the rate

$$\tau_{\tilde{c}} \equiv \tau_c + (1 - \tau_c)\tau_d.$$

Specifically, they are first taxed at rate τ_c at the corporate level. The remaining share of profits $1 - \tau_c$ that is distributed to shareholders is then taxed at rate τ_d at the individual level.

Finally, in line with the recent US history, we assume that personal income is taxed at a (weakly) lower rate than corporate income (from C corporations):

Assumption 1. *The tax rates τ_i, τ_d and τ_c are in the interval $[0, 1)$ and satisfy*

$$\tau_i \leq \tau_{\tilde{c}} \Longleftrightarrow (1 - \tau_d)(1 - \tau_c) \leq 1 - \tau_i.$$

While this inequality is strict in the data (and in our main quantitative experiment), the case with equality will serve as a useful benchmark. In our economy, the "tax wedge"

$$\omega \equiv \frac{1 - \tau_i}{(1 - \tau_c)(1 - \tau_d)} - 1 = \frac{1 - \tau_i}{1 - \tau_{\tilde{c}}} - 1 \geq 0$$

is a sufficient statistic for all tax policy parameters to compute the equilibrium allocation. That is, all combinations of tax rates $\{\tau_i, \tau_c, \tau_d\}$ that imply the same tax wedge ω will result in the same equilibrium allocation. Only government revenue and indi-

[11] We choose to make equity issuance costs proportional to the costs of debt financing as this allows to derive more transparent analytical results. Alternatively, one can define equity issuance costs as μe^o, independent of the interest rate. While less tractable, that alternative choice implies similar qualitative and quantitative results.

vidual consumption levels will be affected by the values of the various tax rates, but not the occupational choice of individuals, nor the legal form of entrepreneurs, nor the allocation of capital and labor across firms.

Timing. While the model is static, decisions take place in a specific sequence.

First, agents decide on their occupation. If they become workers, they inelastically supply their effective labor endowment as determined by their working ability ν. If they become entrepreneurs, they decide first whether to organize their firm as a pass-through or as a C corporation. Then, they decide how how much labor l and capital k to rent. Finally, they choose how to fund their capital investment (the financing structure of the firm) subject to the financial frictions described above.

Entrepreneurs also decide how to use their own wealth: how much of it to invest as inside equity in their own firm, and how much to invest elsewhere, in debt and stock issued by other firms. Similarly, workers allocate their own wealth in a portfolio of debt and outside equity issued by firms.

Finally, production takes place, workers are paid their wages and debt holders are paid their promised returns. We assume, for simplicity, that there is no capital depreciation in production and that capital can be converted one-for-one into the consumption good. The residual income of each firm is divided between the remuneration paid to the entrepreneur (as managerial wage) and the dividends to equity owners. Agents then pay their taxes and consume their after tax income as well as all their wealth.

2.2 Individual Optimization

Figure 2 schematically summarizes the individual optimization problem. Each agent, given her wealth a and abilities (θ, ν) decides to become an entrepreneur (E) or a worker (W) depending on which occupation gives her higher consumption:

$$c(a, \theta, \nu) = \max\{c^E(a, \theta), c^W(a, \nu)\},$$

where $c^E(a, \theta)$ denotes the maximal level of consumption that an agent with characteristics (a, θ) can obtain as an entrepreneur, and similarly $c^W(a, \nu)$ as a worker.

The value of $c^E(a, \theta)$ in turn reflects the optimal decision regarding how to organize the firm. Letting $c^C(a, \theta)$ be the level of consumption attained by an entrepreneur who runs the firm as a C corporation (C) and $c^P(a, \theta)$ the corresponding term if the firm operates as a pass-through entity (P), we have:

$$c^E(a, \theta) = \max\{c^C(a, \theta), c^P(a, \theta)\}.$$

We turn now to determining these values of consumption associated to the different occupational and organization choices.

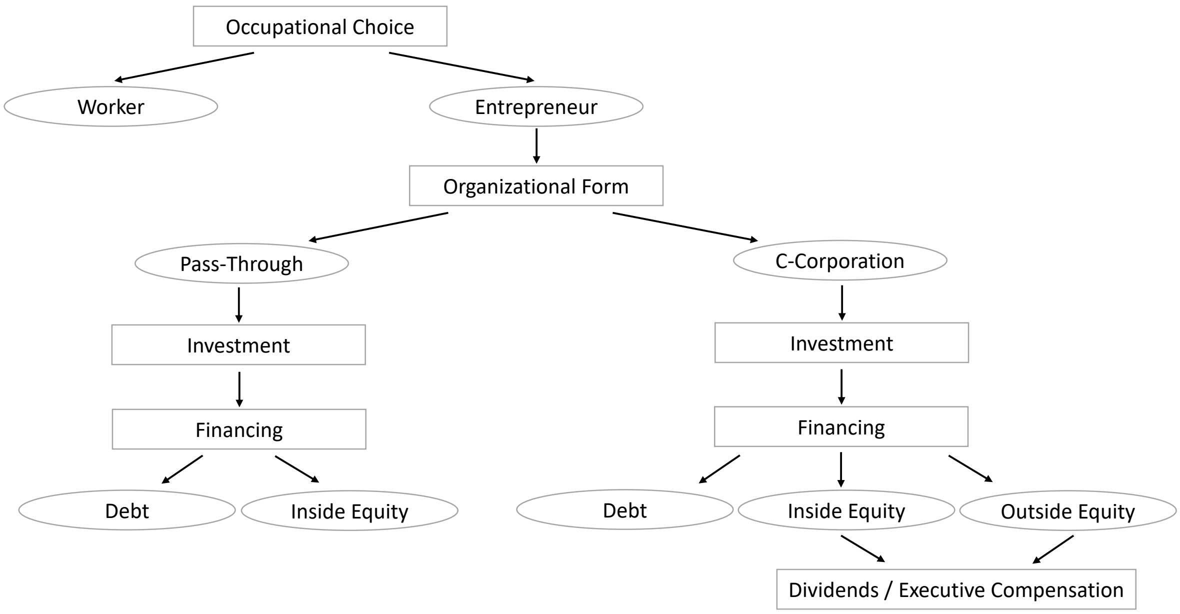

Figure 1: Individual Decision Tree

2.2.1 Owner-Managers of Pass-Through Businesses

We examine first the problem faced by the owner of a pass-through business. To simplify notation, it is convenient to determine first the optimal labor demand conditional on the level of capital k and managerial talent θ:

$$l(k,\theta) = \arg\max_{l} F(k,l,\theta) - wl. \tag{2}$$

Since labor demand is unrestricted, the optimal choice simply equates the marginal product of labor to the wage,

$$w = F_l(k,l(k,\theta),\theta). \tag{3}$$

Given this, optimal consumption of a pass-through owner is given by:

$$c^P(a,\theta) = (1-\tau_i)\max_{k\le\frac{a}{\lambda}}\left\{F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-a)\right\} + a, \tag{4}$$

Recalling that pass-throughs cannot issue outside equity, the entrepreneur's own assets are the only source of equity. Therefore, the borrowing constraint reduces to $k \le \frac{a}{\lambda}$. Independent of the allocation of wealth, at the end of the period the agent receives the principal of her investment a, which is tax free (i.e., there are no wealth taxes).

The first order conditions determining the firm's optimal capital stock are then:

$$\begin{array}{ll} (i) & F_k\big(\tfrac{a}{\lambda}, l\big(\tfrac{a}{\lambda}, \theta\big), \theta\big) > r \quad \text{and} \quad k = \tfrac{a}{\lambda}, \text{ or} \\ (ii) & F_k\big(k, l(k, \theta), \theta\big) = r \quad \text{and} \quad k \leq \tfrac{a}{\lambda}. \end{array}$$

In case (i) the entrepreneur's wealth a is low enough such that when all of it is invested in her firm, the marginal product of capital exceeds the interest rate r. Thus, the borrowing constraint binds and the optimal investment size is $k = a/\lambda$. We refer to firms operating in this situation as *constrained pass-throughs.*

In case (ii) the borrowing constraint is instead slack and capital is optimally set at the level $k^*(\theta)$ such that $F_k(k^*(\theta), l(k^*(\theta), \theta), \theta) = r$. Firms in this situation are referred to as *unconstrained pass-throughs.*

We emphasize some important features of pass-throughs' optimal choices. First, investment in unconstrained pass-throughs only depends on the entrepreneur's managerial ability θ and is independent of initial wealth a. Conversely, in constrained pass-thoughs, it does not vary with θ but is instead strictly increasing in a.

Second, owner-managers of unconstrained pass-throughs invest part $(a - k^*(\theta))$ of their wealth outside the firm, in debt or equity issued by other firms.

Third, the optimal level of capital (and of labor) is independent of taxes for all pass-throughs. This implies that any variation of the tax wedge affects them only indirectly through its effect on equilibrium factor prices r and w.

Fourth, since $k^*(\theta)$ is increasing in θ, the higher is managerial talent θ, the more likely it is that the firm is debt constrained. Hence, constrained pass-throughs tend to exhibit high values of θ and/or low values of a.

Formally, we can summarize the last property as:

Property 1: Characterization of pass-throughs

There exists $\bar{a}(\theta)$ and $\underline{\theta}(a)$ such that

- Given θ, if $a < \bar{a}(\theta)$, pass-throughs are constrained.
- Given a, if $\theta > \underline{\theta}(a)$, pass-throughs are constrained.

Capital- vs. Managerial Income. As will become clear below, computing the relative tax incidence shares of capital vs. managerial talent requires to decompose entrepreneurs' total income into a capital- and a managerial component. Disentangling these components is known to be difficult empirically. For this paper, it is appealing to define the capital income of *all* agents as the product of their wealth and the interest rate, ra, such capital income is independent of occupational choice.[12]

[12] While this choice affects the relative split of the tax incidence born by the production factors capital and management, it does not affect the incidence on labor, and neither the incidence by occupation.

The managerial wage income of owner-managers of unconstrained pass-throughs can then be written as

$$\theta w^m_{P_u} = F(k_{P_u}(\theta), l_{P_u}(\theta), \theta) - w l_{P_u}(\theta) - r k_{P_u}(\theta),$$

where $(k_{P_u}(\theta), l_{P_u}(\theta))$ denotes optimal factor demand and $w^m_{P_u}$ is the managerial wage rate, that is the wage per efficiency unit θ. Observe that $w^m_{P_u}$ is independent of (a, θ) due to the wealth-invariance of factor demand in unconstrained businesses.

The managerial wage income of owner-managers of constrained pass-throughs, whose optimal factor demand $(k_{P_c}(a, \theta), l_{P_c}(a, \theta))$ depends not only on productivity θ but also on wealth a, is given by

$$\theta w^m_{P_c}(a, \theta) = F(k_{P_c}(a, \theta), l_{P_c}(a, \theta), \theta) - w l_{P_c}(a, \theta) - r k_{P_c}(a, \theta).$$

A consequence of the wealth-dependence of factor demand is that their wage rate per efficiency unit $w^m_{P_c}(a, \theta)$ depends on the entrepreneur's characteristics (a, θ).

2.2.2 Owner-Managers of C Corporations

We proceed to analyze the problem of C corporations. We assume that, independently of the size of outside equity, the entrepreneur remains the controlling shareholder. This assumption is motivated by the presence of a large number of publicly traded, large (and relatively young) C corporations in the data, where the initial entrepreneur is the key decision maker and there is a large dispersed set of external investors.

The optimization problem of the entrepreneur in a C corporation features some additional decisions compared to pass-throughs. She not only chooses the input levels of capital k and labor l and the amount of debt, but also how much outside equity e^o is issued to finance the capital stock. In addition, the division of post-tax profits between managerial compensation and dividends to equity holders is non-trivial.

Regarding the latter, entrepreneurs must provide a dividend r^e to shareholders (including themselves) so that the after tax return on equity for outside investors is not dominated by the net return on debt: $(1 - \tau_i)r \leq (1 - \tau_d)r^e$. The presence of a positive tax wedge ω implies that the entrepreneur pays lower taxes on the income she obtains as managerial wage than as dividends from her own company. Hence, it is never optimal to pay dividends above the required minimum:

$$(1 - \tau_i)r = (1 - \tau_d)r^e. \tag{5}$$

Owner-managers of C corporations could, in principle, replicate the same tax treatment as those of pass-throughs if they did not issue any outside equity. In that case, the above constraint on dividends would not apply and managerial salaries could be set sufficiently high such that profits are zero. However, this is an off-equilibrium scenario because by choosing the legal form of a pass-through, and thus saving fixed cost of incorporation κ, these agents would be better off. It follows that in equilibrium, all C corporations issue a positive amount of outside equity, $e^o > 0$.

Another consequence of the tax wedge (and of the outside equity issuance cost) is that it is always cheaper for a firm to raise funds via debt or inside equity (e^i) than via outside equity. Thus, entrepreneurs resort to the latter only once they invested as inside equity all their private wealth into their firm, $e^i = a$, and the debt constraint binds. Outside equity is issued to further increase investment to $k = \frac{a+e^o}{\lambda}$. Consequently, there is a pecking order of funds.

We summarize these properties in Lemma 1:

Lemma 1. *In equilibrium, C corporations are characterized by* $e^o > 0$, $e^i = a$, $k = \frac{a+e^o}{\lambda}$ *and* $r^e = \frac{(1-\tau_i)r}{1-\tau_d}$.

As we explained above, the positive tax wedge implies that the owner would like to pay herself as much as possible through salaries.[13] This implies that the managerial wage income in C corporations $\theta w_C^m(a,\theta)$ is implicitly determined by

$$(1-\tau_c)\left[F(k,l(k,\theta),\theta) - wl(k,\theta) - \mu r e^o - r(k-a-e^o) - \kappa - \theta w_C^m(a,\theta)\right] = r^e(a+e^o).$$

This equation implies that after tax profits (where managerial salaries are part of the costs) are just enough to cover the total dividends paid out to external and internal equity. Rearranging, we can express managerial wage income as

$$\theta w_C^m(a,\theta) = F(k,l(k,\theta),\theta) - wl(k,\theta) - \mu r e^o - r(k-a-e^o) - \kappa - (\omega+1)r(a+e^o). \quad (6)$$

This shows that the equity issuance cost μ, incorporation cost κ, and the tax wedge ω all reduce managerial compensation, making C corporations less attractive.

Given this, we write the optimization problem of the managers of C corporations as

$$\max_k (1-\tau_i)\left[F(k,l(k,\theta),\theta) - wl(k,\theta) - (\omega+\mu)r\lambda k + \mu r a - rk - \kappa\right] + (1-\tau_d)r^e a + a,$$

where we substituted $e^o = \lambda k - a$. In the absence of financial frictions and tax wedges ($\mu = \omega = 0$), the cost of internal and outside capital is the same and equal to r. Both $\mu > 0$ and $\omega > 0$ increase the marginal cost of capital in proportion to the leverage requirement λ. The solution of the above problem determines $c^C(a,\theta)$.

The optimality condition with respect to investment is

$$F(k,l(k,\theta),\theta) = r\big(1+\lambda(\omega+\mu)\big) \equiv q > r. \quad (7)$$

[13] This optimal declaration of income in the form of managerial wages rather than profits finds support in the data and was most recently documented by Smith, Yagan, Zidar and Zwick (2022).

This condition implies that equilibrium investment at C corporations is a function of θ only, and does not depend on the entrepreneur's own assets a. Furthermore, the marginal cost of capital in C corporations is higher than in pass-throughs due to the presence of equity issuance costs μ and the tax wedge ω. It follows that, comparing firms of different organizational forms run by entrepreneurs with the same managerial ability θ, C corporations are smaller than unconstrained pass-throughs, the more so the larger μ and ω. Furthermore, since an entrepreneur considers choosing the legal form of a C corporation to raise more funds, she takes into account that such choice implies a discrete jump in the cost of funds. Entrepreneurs will find it optimal to form a C corporation only when their level of private wealth a is so low (and/or θ so high) such that the marginal product of capital at $k = a/\lambda$ exceeds $r(1+\lambda(\omega+\mu))$.

Managerial Wage vs. the Marginal Product of Management. Since the amount of outside equity issuance depends on the entrepreneurs' wealth, her managerial wage $w_C^m(a,\theta)$ depends on her characteristics (a,θ). However, the fact that both the marginal product of labor and the marginal product of capital is equalized across all C corporations implies, by Euler's theorem, that also the marginal product of management is equalized, and hence does not depend on the entrepreneurs' wealth. Specifically, denoting a C corporation's factor demand by $(k_C(\theta), l_C(\theta))$, Euler's theorem implies

$$F(k_C(\theta), l_C(\theta), \theta) = k_C(\theta) r\big(1+\lambda(\omega+\mu)\big) + l_C(\theta) w + \theta \hat{w}_C^m,$$

where we refer to the marginal product of management in C corporations as the entrepreneur's *shadow wage* $\hat{w}_C^m$. This shadow wage is independent of wealth for the same reason as it is independent of wealth for managers of unconstrained pass-throughs. The actual wage, which accounts for incorporation costs and the wealth dependence of equity issuance costs, is related to this shadow wage. Specifically using Euler's theorem, equation (6) is equivalent to

$$\theta w_C^m(a,\theta) = \theta \hat{w}_C^m - \kappa + \mu r a. \tag{8}$$

Choice of Organizational Form. Denote the output of a C corporation whose manager has ability θ by

$$y_C(\theta) = F(k_C(\theta), l_C(\theta), \theta).$$

The threshold level of wealth $\underline{a}(\theta)$ at which an entrepreneur is indifferent between running a C corporation or a constrained pass-through is implicitly given by

$$\begin{aligned} F\Big(\tfrac{\underline{a}(\theta)}{\lambda}, \theta\Big) - wl\Big(\tfrac{\underline{a}(\theta)}{\lambda}, \theta\Big) - r\tfrac{1-\lambda}{\lambda}\underline{a}(\theta) = \\ y_C(\theta) - wl_C(\theta) - r\Big[k_C(\theta)(1+\lambda(\omega+\mu)) - \underline{a}(\theta)(1+\mu)\Big] - \kappa. \end{aligned}$$

At this level of wealth the C corporation needs to be larger to provide the same total entrepreneurial income as the constrained pass-through, that is $k_C(\theta) > \frac{a(\theta)}{\lambda}$.[14]

Summarizing, we can characterize the optimal choice of organizational form.

Property 2: Characterization of Legal Form

There exists $\underline{a}(\theta)$, $\bar{a}(\theta)$, $\underline{\theta}(a)$ and $\bar{\theta}(a)$ such that

- Given θ,
  1. if $a \geq \bar{a}(\theta)$, the entrepreneur runs an unconstrained pass-through;
  2. if $\bar{a}(\theta) > a \geq \underline{a}(\theta)$, she runs a constrained pass-through;
  3. if $a < \underline{a}(\theta)$, she runs a C corporation.
- Given a,
  1. if $\theta \leq \underline{\theta}(a)$, she runs an unconstrained pass-through;
  2. if $\bar{\theta}(a) > \theta \geq \underline{\theta}(a)$, she runs a constrained pass-through;
  3. if $\theta > \bar{\theta}(a)$, she starts a C corporation.

Figure 2 shows for a fixed θ the organizational form of the business (C corporation C, constrained pass-through P_c, unconstrained pass-through P_u) as a function of the entrepreneur's wealth. The left panel depicts the marginal product of capital, which for C corporations and unconstrained pass-throughs equals the marginal cost of capital. The right panel shows the implications of these financing costs for capital demand.

The efficient allocation of capital across firms would equalize marginal products. Misallocation arises because financial frictions and the tax wedge imply the presence of constrained pass-throughs and higher productivity of C corporations relative to unconstrained pass-throughs.

2.2.3 Workers

The consumption of a worker with wealth a and working ability ν is given by

$$c^W(a,\nu) = (1-\tau_i)(w\nu + ra) + a.$$

While a may be invested in stocks or bonds, due to the no-arbitrage condition (5) net returns are equalized, implying an indeterminate optimal portfolio allocation.

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[14] Observe that with $\kappa = 0$ there is a discontinuity in investment only if $\omega > 0$ but not if $\omega = 0$ and $\mu > 0$. Contrary to the cost μ which applies only to marginal equity issuances, the entrepreneur has to pay the additional taxes on all his equity, reducing his income by a discrete amount. To offset the loss in net income she has to scale up capital by a discrete amount.

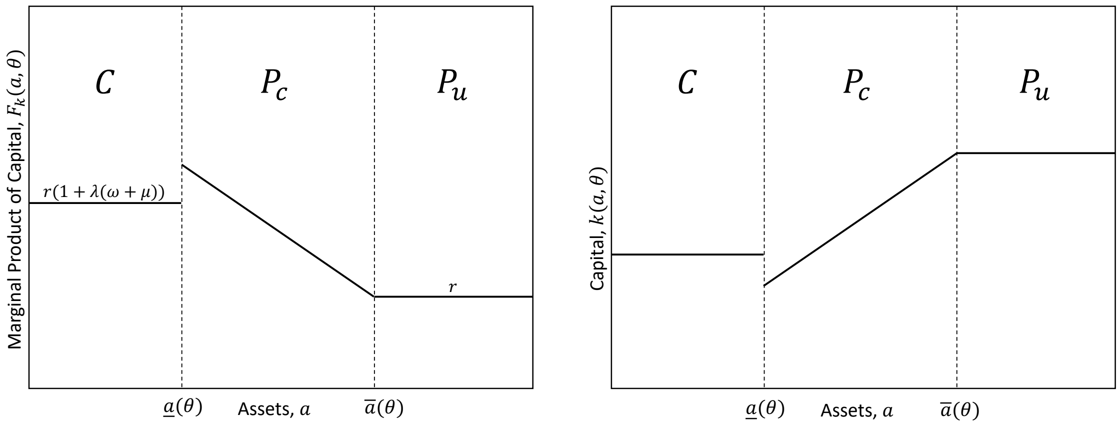

Figure 2: Capital demand as a function of a (given θ)

Each agent chooses the occupation which maximizes her consumption

$$c(a,\theta,\nu) = \max\{c^E(a,\theta), c^W(a,\nu)\}.$$

It follows from the previous analysis that when an agent's wealth is sufficiently high relative to her managerial talent, $a \geq \underline{a}(\theta)$, the relevant choice is between being an entrepreneur in a pass-through firm and a worker. Given equilibrium prices, this choice depends only on the agent's comparative advantage, i.e. on the ratio θ/ν, when her wealth $a \geq \bar{a}(\theta)$. In the intermediate range of wealth, when $a \in (\bar{a}(\theta), \underline{a}(\theta))$, both her comparative advantage and her wealth matter for deciding between being a worker and running a constrained pass-through. Finally, for agents with wealth $a < \underline{a}(\theta)$, the choice is between running a C corporation and being a worker. This choice depends again on her relative skill θ/ν and her level of wealth.

The presence of financing constraints generates a misallocation of talent as some agents with high managerial ability, due to their lack of wealth, decide to become workers rather than entrepreneurs.

2.3 Equilibrium

Both labor and asset markets are competitive. Hence, the equilibrium wage w and interest rate r clear these markets.

Labor market. Let $k(a,\theta)$ denote the capital demand of entrepreneurs with wealth a and managerial skill θ. In equilibrium, the labor demand of entrepreneurs $l(k(a,\theta),\theta)$, obtained from (3), equals the effective labor supply of workers,

$$\int_{c^E(a,\theta)>c^W(a,\nu)} l(k(a,\theta),\theta)d\Gamma(a,\theta,\nu) = \int_{c^E(a,\theta)\leq c^W(a,\nu)} \nu d\Gamma(a,\theta,\nu).$$

Capital market. Market clearing for capital requires that the total demand for capital by entrepreneurs equals the total amount of wealth agents are initially endowed with,

$$\int_{c^E(a,\theta)>c^W(a,\nu)} k(a,\theta) d\Gamma(a,\theta,\nu) = \int a d\Gamma(a,\theta,\nu).$$

The two above conditions then ensure, by Walras' law, that asset markets also clear. Even though two financial assets, bonds and stocks, are traded, the no-arbitrage condition (5) guarantees that households are indifferent between holding either of them. Market clearing in asset markets then boils down to a single condition, requiring that the amount of corporate debt and outside equity issued by firms equals the demand for assets by workers (equal to their entire wealth) and by entrepreneurs (equal to the part of their wealth not invested in their own firm).

3 Equilibrium Effects of Tax Changes

In this section, we explore analytically how equilibrium outcomes are affected by tax changes. This provides the basis for the analysis of how the tax burden is shared across production factors and occupations (tax incidence).

In partial equilibrium, fixing wages and the interest rate, an increase of the tax wedge ω affects C corporations only by raising their financing costs. Specifically, the percentage change in the cost of capital q due to a marginal increase in the wedge ω is given by

$$\tilde{\eta}_{q,\omega} = \frac{\partial \log q}{\partial \omega} = \frac{\partial \log r(1+\lambda(\omega+\mu))}{\partial \omega} = \frac{\lambda}{1+\lambda(\omega+\mu)}.$$

The rise in financing costs reduces C corporations' demand for capital and makes the legal form of C corporations less attractive, leading to a shift out of the corporate sector to constrained constrained pass-throughs. Since C corporations have greater access to funds and, thus, tend to be large relative to pass-throughs (given θ) this reallocation further lowers capital demand. Figure 3 represents these effects graphically.

The depicted reduction in capital demand triggers a sequence of equilibrium responses: on factor prices, managerial compensation, aggregate income and revenue. In this section we discuss all these responses, which in turn will be crucial to understand how the incidence of corporate tax increases is shared.

To allow for the derivation of clearer comparative statics results, we will from now on focus our attention on the case where the production function is Cobb-Douglas:

$$F(k,l,m) = k^{\alpha_k} l^{\alpha_l} m^{\alpha_m}, \quad \text{where} \quad \alpha_k + \alpha_l + \alpha_m = 1.$$

Total output, gross of equity issuance and incorporation costs, is the sum of output produced in C corporations (Y_C), constrained pass-throughs (Y_{P_c}) and unconstrained

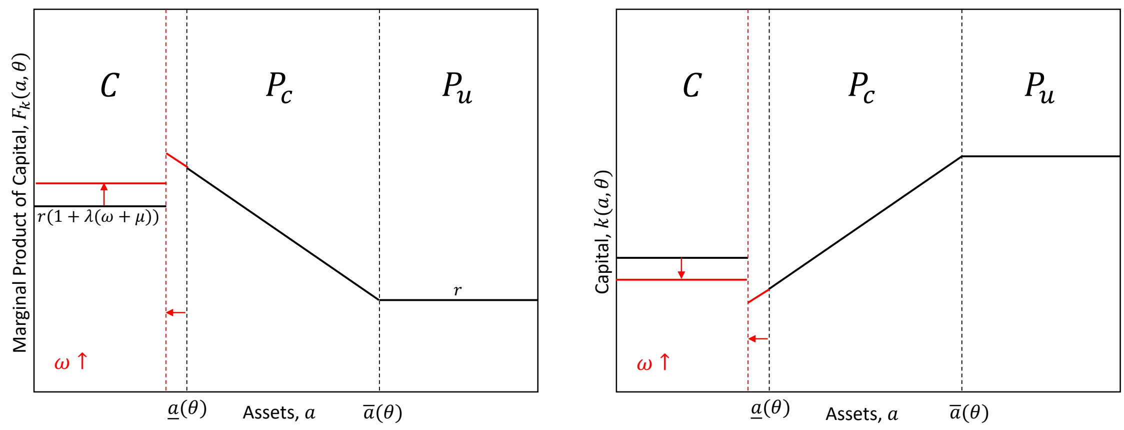

Figure 3: Partial equilibrium effect of increasing ω on capital demand

pass-throughs (Y_{P_u}),

$$Y = Y_C + Y_{P_c} + Y_{P_u},$$

where Y_C is the output produced in C corporations before the wasteful costs of incorporation and equity issuance are deducted.

In the following we denote by K_X, L_X and M_X, for each $X \in \{C, P_c, P_u\}$, the total effective capital, labor, and management employed in firms of type X. Furthermore, we denote by C, P_c and P_u the share of individuals becoming entrepreneurs and operating, respectively, a C corporation, a constrained pass-through and an unconstrained pass-through, and by W the share of workers. Finally, we denote by $\overrightarrow{XY}$ the share of agents, which upon a marginal increase in ω changes occpation/organizational form from X to Y.[15]

As mentioned, the equilibrium allocation of production factors depends on taxes only via the level of the tax wedge ω. Thus, we first characterize the changes of any equilibrium variable x as a semi-elasticity with respect to the tax wedge,

$$\eta_{x,\omega} = \frac{d \log x}{d\omega}.$$

One can then easily obtain the relative change of x with respect to a marginal increase in any $\tau \in \{\tau_i, \tau_c, \tau_d, \tau_{\tilde{c}}\}$ as

$$\eta_{x,\tau} = \eta_{x,\omega} \frac{d\omega}{d\tau}.$$

15 A formal definition is provided in the proof of Proposition 1.

3.1 The Effect on Wages and Interest Rates

We start with deriving the effects on wages and interest rates, that is $\eta_{w,\omega}$ and $\eta_{r,\omega}$. It is helpful to first consider a special case of the model, in which occupations and organizational forms are invariant to small changes in the tax wedge:

Assumption 2. *For all* (a, θ) *we have that* $\gamma_{a|\theta}(\underline{a}(\theta)|\theta) = \gamma_{\nu|a,\theta}(\tilde{\nu}(a,\theta)|a,\theta) = 0$, *where* $\underline{a}(\theta)$ *denotes the wealth level at which agents with entrepreneurial ability* θ *are indifferent between organizational forms and* $\tilde{\nu}(a,\theta)$ *denotes the level of working ability at which agents with wealth* a *and entrepreneurial ability* θ *are indifferent between occupations.*

The drop in C corporations' demand for capital requires the interest rate to decline, such that unconstrained pass-throughs (whose debt constraint does not bind) are willing to absorb the released capital. Since unconstrained pass-throughs face a higher relative price of labor, they demand less labor per unit of capital than C corporations. Absent changes in occupation, this implies that wages must decline for the labor market to clear. In turn, such a decline in wages increases the demand for capital by both types of firms, mitigating the decline in the interest rate.

Allowing for changes in occupation and organizational form, some owner-managers of C corporations may decide to reorganize or to become workers, while some workers may decide to become entrepreneurs and run a pass-through business, inducing further changes in the supply and demand for production factors that impact equilibrium prices.

Proposition 1 provides the formal characterization of equilibrium price changes.

Proposition 1. ***Factor Price Responses.*** *Suppose Assumption 1 is satisfied. Then, the price effects of a marginal increase in the tax wedge* $d\omega > 0$ *are as follows:*

1. *Under Assumption 2, the wage change*

$$\eta_{w,\omega} = -\frac{\alpha_k(1-\alpha_l)}{\alpha_m} \frac{\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}} \frac{Y_C}{Y} \tilde{\eta}_{q,\omega} \equiv \hat{\eta}_{w,\omega} \leq 0 \tag{9}$$

   is weakly negative, while the change in the interest rate is given by

$$\eta_{r,\omega} = -\frac{K_C}{K_C+K_{P_u}} \tilde{\eta}_{q,\omega} - \frac{\alpha_l}{1-\alpha_l} \hat{\eta}_{w,\omega} \equiv \hat{\eta}_{r,\omega} \tag{10}$$

   and thus depends negatively on the wage change.

2. *When Assumption 2 does not hold, the wage change is instead given by*

$$\eta_{w,\omega} = \hat{\eta}_{w,\omega} + \left[\beta^{w}_{\overrightarrow{CP_c}} \overrightarrow{CP_c} + \beta^{w}_{\overrightarrow{CW}} \overrightarrow{CW} + \beta^{w}_{\overrightarrow{WP_c}} \overrightarrow{WP_c} + \beta^{w}_{\overrightarrow{WP_u}} \overrightarrow{WP_u}\right] \frac{Y_C + Y_{P_u}}{Y} \tag{11}$$

and the change in the interest rate is

$$\eta_{r,\omega} = \hat{\eta}_{r,\omega} + \left[\beta^{r}_{\overrightarrow{CP_c}}\overrightarrow{CP_c} + \beta^{r}_{\overrightarrow{CW}}\overrightarrow{CW} + \beta^{r}_{\overrightarrow{WP_c}}\overrightarrow{WP_c} + \beta^{r}_{\overrightarrow{WP_u}}\overrightarrow{WP_u}\right]\frac{Y_C + Y_{P_u}}{Y}, \tag{12}$$

where the values of the terms $\beta^{x}_{\overrightarrow{CP_c}}, \beta^{x}_{\overrightarrow{CW}}, \beta^{x}_{\overrightarrow{WP_c}}, \beta^{x}_{\overrightarrow{WP_u}}$ *for* $x \in \{w, r\}$ *are determined below in Section 3.1.2.*

3.1.1 Inelastic Occupations and Organizational Form

Part 1 of the proposition describes the price changes under the assumption that occupations and organizational forms are invariant to marginal changes in the tax wedge. We focus on an equilibrium with a positive mass of both C corporations and unconstrained pass-throughs; i.e., $C > 0$ and $P_u > 0$. It is clear from (9) that the change in the tax wedge has a strictly negative effect on wages, $\eta_{w,\omega} < 0$, only if this condition is satisfied. Constrained pass-throughs' capital demand is inelastic by design, implying that the reallocation of capital operates only between C corporations and unconstrained pass-throughs.

Notice that a second condition needed for $\eta_{w,\omega} < 0$ is the presence of a positive tax wedge or a positive cost of equity issuance ($\mu + \omega > 0$). Under this condition, there is misallocation as the marginal products of capital are not equalized across firms. To understand the consequences of this misallocation, note that we can rewrite the middle term in (9) as

$$\frac{\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{Y_C}{Y} = \left(\frac{L_C}{L_C+L_{P_u}} - \frac{K_C}{K_C+K_{P_u}}\right)\frac{L_C+L_{P_u}}{L} > 0.$$

Whenever $\mu + \omega > 0$ C corporations face a higher relative price of capital than unconstrained pass-throughs, implying that they operate with relatively more labor and less capital, such that $\left(\frac{L_C}{L_C+L_{P_u}} - \frac{K_C}{K_C+K_{P_u}}\right)$ is positive and increasing in the tax wedge. This misallocation implies that the direct effect of the change in the tax wedge on the marginal cost of capital for C corporations, $\tilde{\eta}_{q,\omega}$, leads to a change in wages with the opposite sign. In other words, the reallocation of economic activity from unconstrained pass-throughs to C corporations lowers labor demand (per unit of capital). For factor markets to clear, wages must decline.

Turning our attention to the effects on the interest rate, we see that the first term in (10) is proportional, with opposite sign, to the direct effect on C corporation's financing cost $\tilde{\eta}_{q,\omega}$. The factor of proportionality equals the ratio of capital employed in C corporations to the total capital employed in C corporations and unconstrained pass-throughs ($K_C/(K_C + K_{P_u})$). A larger C corporation sector implies that any given mechanical increase in their financing costs $\tilde{\eta}_{q,\omega}$, releases more capital, which unconstrained pass-throughs are only willing to absorb if the drop in the interest rate is large enough. In addition, as long as there is some factor misallocation and hence $\eta_{w,\omega} < 0$, the interest rate response is mitigated by the response of wages. Due to the complementarity between factors, the decline in wages moderates the decrease in C corporations' capital demand and increases the capital demand of pass-throughs. We see from (10) that this second, indirect, effect has always the opposite sign of the first (in our quantitative analysis dominating) effect.

In Appendix B.1 we explain the factor price responses for the case of inelastic occupations and organizational form in more detail.

3.1.2 Allowing for Changes in Occupations and Organizational Forms

Part 2 of Proposition 1 describes the changes in factor prices in the general case when some individuals alter their occupation and/or legal form of business. We see from (11) and (12) that the response of wages and the interest rate is given by the same expressions derived in Part 1 ($\hat{\eta}_{w,\omega}$ and $\hat{\eta}_{r,\omega}$) plus some additional terms that describe the effects of the induced changes in occupation and legal form. These switches are depicted in Figure 4.

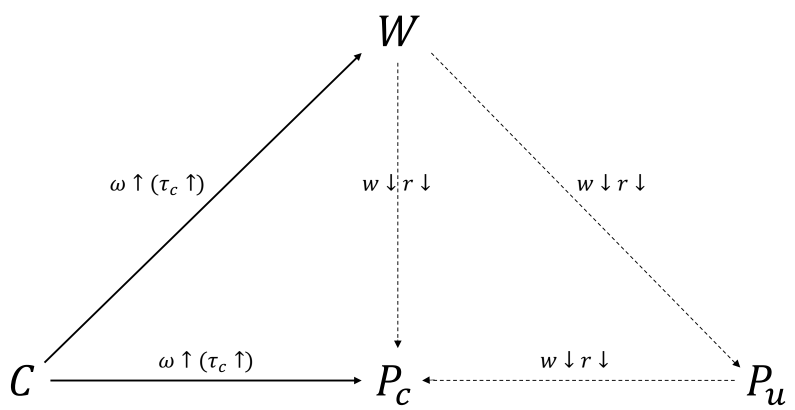

Figure 4: Switches in Organisation Form and Occupation

Change in Organizational Form. The horizontal line in Figure 4 describes changes in firms' legal form. First, as discussed, the increase in the cost of capital implied by the increased tax wedge will induce some owners of C corporations (whose productivity as an entrepreneur is significantly higher than as a worker and whose assets are just below $\underline{a}(\theta)$) to reorganize their business as a constrained pass-through. These entrepreneurs can no longer employ capital in excess of the leverage constraint, which due to factor complementarity also reduces their labor demand. The terms

$$\beta^{w}_{\overrightarrow{CP_c}} = -\left(1-\alpha_l\right)\frac{\bar{l}_{C,\overrightarrow{CP_c}} - \bar{l}_{P_c,\overrightarrow{CP_c}}}{L_C + L_{P_u}} + \alpha_k \frac{\bar{k}_{C,\overrightarrow{CP_c}} - \bar{k}_{P_c,\overrightarrow{CP_c}}}{K_C + K_{P_u}} < 0 \qquad \text{and}$$

$$\beta^{r}_{\overrightarrow{CP_c}} = -\left(1-\alpha_k + \frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C + Y_{P_u}}\right)\frac{\bar{k}_{C,\overrightarrow{CP_c}} - \bar{k}_{P_c,\overrightarrow{CP_c}}}{K_C + K_{P_u}} + \alpha_l \frac{\bar{l}_{C,\overrightarrow{CP_c}} - \bar{l}_{P_c,\overrightarrow{CP_c}}}{L_C + L_{P_u}}$$

capture the marginal effect of these demand changes on equilibrium factor prices. In the above expressions, $\bar{l}_{C,\overrightarrow{CP_c}}$ denotes the average labor demand of entrepreneurs with threshold wealth $\underline{a}(\theta)$ if they were to form a C corporation, while $\bar{l}_{P_c,\overrightarrow{CP_c}}$ denotes their labor demand if they form a constrained pass-through. The expressions for capital are defined analogously. Obviously $\bar{k}_{C,\overrightarrow{CP_c}} > \bar{k}_{P_c,\overrightarrow{CP_c}}$ since the only reason to form a C corporation in the first place is that one can acquire a higher capital stock. The complementarity between capital and labor then implies that also $\bar{l}_{C,\overrightarrow{CP_c}} > \bar{l}_{P_c,\overrightarrow{CP_c}}$.

The reduction of labor and capital demand by these firms implies a drop in wages and interest rates, described by the first term in each of the two equations above. An additional effect is then generated by the fact that the decline in the price of one factor increases also the demand for the other factor. This second effect is described by the second term in the two equations above, which has the opposite sign to the first. Since capital demand of constrained pass-throughs is inelastic to changes in the interest rate, the effect of lower capital demand is is amplified by $\frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C+Y_{P_u}}$, the adjusted shares of constrained pass-throughs. For the case of wage changes, we can show analytically that the first, direct effect always dominates so that the effect on wages of these changes in the legal form of firms is negative.[16] With regard to the change in the interest rate, we show numerically in the next section for the calibrated economy we consider that the effect is also negative.

Note that the change in prices may also change the fraction of pass-through firms that are constrained. In particular, a decline in wages and in the interest rate induces some previously unconstrained pass-through to become constrained as their desired size increases (see Figure 4). However, this change has no first-order effect on wages and interest rates as the factor demand is continuous around that wealth threshold.

Changes in Occupations. The increase in the tax wedge also affects occupational choices (see the vertical dimension of Figure 4). First, some C corporation entrepreneurs (who were indifferent between working or running a firm) will switch to become workers. The terms describing the effects of such changes on equilibrium prices are

$$\beta^{w}_{\overrightarrow{CW}} = -(1-\alpha_l)\frac{\bar{l}_{C,\overrightarrow{CW}} + \bar{v}_{W,\overrightarrow{CW}}}{L_C + L_{P_u}} + \alpha_k \frac{\bar{k}_{C,\overrightarrow{CW}}}{K_C + K_{P_u}} < 0 \qquad \text{and}$$

$$\beta^{r}_{\overrightarrow{CW}} = -\left(1-\alpha_k + \frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C + Y_{P_u}}\right)\frac{\bar{k}_{C,\overrightarrow{CW}}}{K_C + K_{P_u}} + \alpha_l \frac{\bar{l}_{C,\overrightarrow{CW}} + \bar{v}_{W,\overrightarrow{CW}}}{L_C + L_{P_u}}.$$

The structure of these terms is very similar to the previous ones, with one important difference. If agents change from running a C corporation to being workers their demand for production factors drops to zero rather than to a positive value. Furthermore, since they now supply their own labor as workers, this increases the excess supply of labor even further (by an amount equal to their average efficiency as workers, $\bar{v}_{W,\overrightarrow{CW}}$). As a consequence, a larger wage decrease is needed to restore equilibrium in the labor

[16] See the proofs of this and further analytical results in Appendix A.

market. This first effect is again partially offset by the consequence of the price reduction of the other factor. Again, for the case of wage changes, we can show analytically that the first, negative, effect dominates and so the effect of this change in occupation on wages is unambiguously negative.

However, an additional effect is present, since declining factor prices induce some workers to start a pass-through business, which may be constrained ($P_x = P_c$) or unconstrained ($P_x = P_u$) depending on these agents' wealth. The corresponding effects are

$$\beta^{w}_{\overrightarrow{WP_x}} =(1-\alpha_l)\frac{\bar{l}_{P_x,\overrightarrow{WP_x}} + \bar{v}_{W,\overrightarrow{WP_x}}}{L_C + L_{P_u}} - \alpha_k \frac{\bar{k}_{P_x,\overrightarrow{WP_x}}}{K_C + K_{P_u}} \qquad \text{and}$$

$$\beta^{r}_{\overrightarrow{WP_x}} = -\alpha_l \frac{\bar{l}_{P_x,\overrightarrow{WP_x}} + \bar{v}_{W,\overrightarrow{WP_x}}}{L_C + L_{P_u}} + \left(1 - \alpha_k + \frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C + Y_{P_u}}\right)\frac{\bar{k}_{P_x,\overrightarrow{WP_x}}}{K_C + K_{P_u}} > 0.$$

Relative to the previous case, this change in occupation represents an increase in factor demand. These agents start demanding capital $\bar{k}_{P_x,\overrightarrow{WP_x}}$, which puts upward pressure on the interest rate. At the same time, these agents no longer supply their effective labor ($\bar{v}_{W,\overrightarrow{WP_x}}$) but instead hire labor ($\bar{l}_{P_x,\overrightarrow{WP_x}}$). This positive effect on labor demand also tends to increase wages.

3.2 The Effect on Managerial Compensation

Next, we discuss how managerial compensation is affected by changes in the tax wedge. As discussed in Section 2.2, the managerial wage rate per efficiency unit θ is homogeneous across all unconstrained pass-throughs but not across the other two types of businesses. However, as we have discussed, the marginal product of management, that is the *shadow wage* $\hat{w}^m_C$, is homogenous also across all C corporations and related to the actual wage rate $w^m_C(a,\theta)$ (which accounts for the costs of incorporation and the heterogeneity in the amount of inside equity a) through equation (8).

In constrained pass-throughs the cost of capital is lower than the marginal product of capital and the difference contributes to the income of the entrepreneur. Denote by $y_{P_c}(a,\theta)$ the output of constrained pass-throughs owned by managers with ability θ and wealth $a \in (\underline{a}(\theta), \lambda k_{P_u}(\theta))$. From Euler's theorem it follows that the managerial wage in this firm is given by

$$\theta w^m_{P_c}(a,\theta) = \alpha_m y_{P_c}(a,\theta) + \left(F_{k,P_c}(a,\theta) - r\right)\frac{a}{\lambda},$$

that is the manager captures as wage income not only the contribution of his talent to output but also the part of capital's contribution that exceeds the financing costs.

Entrepreneurs are hence affected differently by the change in the tax wedge depending on their organizational form and wealth. All firm owners are affected by the general equilibrium effects: lower factor prices favor them. In this sense, the price changes induce a redistribution from workers and capital owners towards entrepreneurs. Additionally, owners of C corporations are affected directly through a mechanical increase in their financing costs when the tax wedge rises. This asymmetry implies that the increase in the tax wedge entails some redistribution from low wealth (relative to managerial productivity θ) entrepreneurs, running C corporations, to high wealth (again relative to θ) entrepreneurs, running unconstrained pass-throughs.

Proposition 2 characterizes the response of managerial wages to the tax change.

Proposition 2. ***Compensation of Managers.*** *Suppose Assumption 1 is satisfied. The effects of a marginal increase in the tax wedge $d\omega > 0$ on the wage rate of managers are as follows:*

1. *in unconstrained pass-throughs:*

$$\eta_{w^m_{P_u},\omega} = -\frac{1}{\alpha_m}\left[\alpha_k \eta_{r,\omega} + \alpha_l \eta_{w,\omega}\right].$$

2. *in C corporations:*

$$\eta_{w^m_C(a,\theta),\omega} = \underbrace{-\frac{1}{\alpha_m}\left[\alpha_k(\eta_{r,\omega} + \tilde{\eta}_{q,\omega}) + \alpha_l \eta_{w,\omega}\right]}_{\eta_{\hat{w}^m_C}} \frac{\theta \hat{w}^m_C}{\theta w^m_C(a,\theta)} + \eta_{r,\omega} \frac{\mu r a}{\theta w^m_C(a,\theta)}.$$

3. *in constrained pass-throughs:*

$$\eta_{w^m_{P_c}(a,\theta),\omega} = -\frac{\alpha_l \eta_{w,\omega} + \eta_{r,\omega}\left(\alpha_k - \frac{(F_{k,P_c}(a,\theta) - r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}\right)}{\alpha_m + \frac{(F_{k,P_c}(a,\theta) - r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}.$$

The change in the remuneration of managers in unconstrained pass-throughs depends negatively on the change in the factor prices of capital and labor, weighted by their respective factor shares. As discussed, these tend to be negative, implying an increasing managerial wage in unconstrained pass-throughs. Furthermore, the managerial wage change is inversely proportional to management's share of output α_m. This is because the higher the management share in production, the less capital and labor is used, implying that the mangers' income is less sensitive to changes in interest rates and wages.

Consider next the managerial income change in C corporations. First, observe that in the absence of incorporation and equity issuance costs ($\kappa = \mu = 0$) managerial wages would be homogeneous across C corporations; i.e., $w^m_C(a,\theta) = \hat{w}^m_C$ for all (a,θ), implying that

$$\eta_{w^m_C(a,\theta)} = \eta_{\hat{w}^m_C} = -\frac{1}{\alpha_m}\left[\alpha_k(\eta_{r,\omega} + \tilde{\eta}_{q,\omega}) + \alpha_l \eta_{w,\omega}\right] = \eta_{w^m_{P_u}} - \frac{\alpha_k}{\alpha_m}\tilde{\eta}_{q,\omega}.$$

Thus, in such an environment the only difference to the managerial wage change in unconstrained pass-throughs $\eta_{w^m_{P_u}}$ is the direct increase in the cost of financing $\tilde{\eta}_{q,\omega}$, which reduces managerial wages in C corporations. Specifically, higher taxes on corporate profits imply lower net dividends to outside investors. To keep these outside investors on board, the owner-manager needs to increase pre-corporate tax dividends at the expense of paying herself a lower wage. The presence of incorporation costs ($\kappa > 0$) reduces the manager's income and implies that any given change in the costs of capital and labor induces a larger relative change in the managerial wage rate. In particular, if we continue to abstract from equity issuance costs ($\mu = 0$), the relative change in the managerial wage is amplified by a factor $\frac{\theta \hat{w}^m_C}{\theta w^m_C(a,\theta)} > 1$. Consider now the opposite case; i.e., abstract from incorporation costs ($\kappa = 0$) but let equity issuance costs be positive ($\mu > 0$). As shown above, equity issuance costs reduce the capital stock and hence the marginal product of management $\hat{w}^m_C$ in C corporations in a homogeneous way. If none of the managers of C corporations had any wealth ($a = 0$) this would again imply that $\eta_{w^m_C(a,\theta)} = \eta_{\hat{w}^m_C}$ for all (a, θ), such that their actual wages would also be affected homogeneously. However, entrepreneurs with different wealth levels issue different amounts of outside equity. In particular, the higher the wealth a of the owner-manager, the less outside equity e^o she needs to issue, implying less wasteful spending on issuance costs and hence a higher managerial wage, $w^m_C(a,\theta) > \hat{w}^m_C$. Consequently, with $\kappa = 0$ and $\mu > 0$, any given changes in the costs of capital and labor induce smaller relative changes in the managerial wage rate, $\frac{\theta \hat{w}^m_C}{\theta w^m_C(a,\theta)} < 1$. The last term in the second part of the proposition takes into account that due to the assumed proportionality of equity issuance costs in the cost of debt, the amount of equity issuance costs which C corporation entrepreneurs save by using their own wealth varies with the interest rate r. This effect, however, turns out to be quantitatively small.

Finally, consider the change in the remuneration of managers of constrained pass-throughs (part 3 of the Proposition). Their wage changes are very similar to those of unconstrained pass-throughs. The main difference is that in these businesses the marginal product of capital is higher than the cost of capital r. The differential $\frac{(F_{k,P_c}(a,\theta)-r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}$ represents additional wage income of the entrepreneur, which mitigates the entrepreneur's exposure to interest changes but has a negative effect on her income when interest rates decline (lower numerator). Furthermore, since the managerial income share is higher than α_m, the sensitivity with respect to both interest rate- and wage changes is reduced (higher denominator). Consequently, managerial wages in constrained pass-throughs increase less than those in unconstrained ones.

3.3 The Effect on Aggregate Gross Income

Aggregate gross income $\tilde{Y}$ is defined as output Y minus equity issuance costs and incorporation costs,

$$\tilde{Y} = Y - \mu r E^o - \kappa C.$$

While the increase in the tax wedge misallocates production factors, reducing output Y, the shift away from C corporations also saves some of the wasteful incorporation- and equity issuance costs. This mitigates the decline in aggregate gross income $\tilde{Y}$ relative to the decline in output Y as the following proposition shows.

Proposition 3. ***Aggregate Gross Income Response.*** *Let Assumption 1 be satisfied. The effect of a marginal increase in the tax wedge $d\omega > 0$ on aggregate gross income is*

$$\eta_{\tilde{Y},\omega} = \eta_{Y,\omega}\frac{Y}{\tilde{Y}} + \frac{\kappa(\overrightarrow{CP_c} + \overrightarrow{CW})}{\tilde{Y}} - \eta_{\mu r E^o,\omega}\frac{\mu r E^o}{\tilde{Y}} \leq 0,$$

where both $\eta_{Y,\omega} \leq 0$ and $\eta_{\mu r E^o,\omega} \leq 0$.

In the absence of incorporation- and equity issuance costs (when $\mu = \kappa = 0$) the change in gross income equals the output change, $\eta_{\tilde{Y},\omega} = \eta_{Y,\omega} \leq 0$. The output change is strictly negative when $\omega > 0$ since then the marginal products of production factors are not equalized and consequently a further reallocation has negative first order effects.

When $\mu > 0$ and/or $\kappa > 0$ the change in gross income due to the misallocation of production factors is mitigated because of lower wasteful expenditures on equity issuances and/or incorporation. The reduction in incorporation costs is exclusively due to agents who, in response to the tax increase, decide to no longer form a C corporation (either by switching to pass-through entrepreneurship or by becoming a worker). On the other hand, the decrease in equity issuance costs also arises from lower equity issuance at the intensive margin.

In Appendix B.2 we discuss the changes in output and gross income in more detail.

3.4 The Effect on Government Revenue

Finally, we analyze how changes in the corporate tax rate affect government revenue. Denoting the pre-corporate tax return on equity by

$$\tilde{r}^e = \frac{r^e}{1-\tau_c},$$

total government revenue can be parsimoniously written as

$$R = \tau_i \tilde{Y} + \left[\tau_{\tilde{c}} - \tau_i\right]\tilde{r}^e \lambda K_C. \tag{13}$$

The first component denotes the government revenue if all income were to be taxed at the personal income tax rate τ_i. The second component is the additional revenue that arises from the fact that profits of C corporations are taxed at a higher effective rate than those of pass-throughs.

Contrary to the equilibrium allocation, the effect of tax changes on revenue depend on the particular combination of tax changes, i.e. not only on the change in the tax wedge

ω. Given our focus, in the following, we characterize the change in revenue due to a marginal increase in the effective corporate tax rate $\tau_{\tilde{c}}$.

Proposition 4. ***Tax Revenue Change.*** *Let Assumption 1 be satisfied. The effect of a marginal increase in the total tax rate on corporate profits $d\tau_{\tilde{c}} > 0$ on government revenue is given by*

$$\eta_{R,\tau_{\tilde{c}}} = \underbrace{\frac{\tilde{r}^e \lambda K_C}{R}(1+\omega)}_{mechanical\ (>0)} + \underbrace{\frac{\tilde{r}^e \lambda K_C}{R}(1+\omega)\omega\left(\eta_{K_C,\omega} + \eta_{r,\omega}\right)}_{behavioral\ (\leq 0)} + \underbrace{\eta_{\tilde{Y},\tau_{\tilde{c}}}\frac{\tau_i \tilde{Y}}{R}}_{misallocation\ (\leq 0)} .$$

The overall tax revenue change can be decomposed into three components. The first component, which we call the 'mechanical' effect, is the effect on revenue if the corporate tax increase would leave the allocation of production factors unchanged. Observe that total corporate profits $\tilde{r}^e \lambda K_C$ are multiplied by $(1+\omega)$ because, in order to keep the allocation unaffected, owner-managers of C corporations need to increase gross dividends such that outside equity holders remain willing to invest and the corporate capital stock can be maintained.

The second component, to which we refer as the 'behavioral' effect, captures the reduction in revenue due to the reallocation of capital away from C corporations to pass-throughs, holding aggregate gross income $\tilde{Y}$ constant. Observe that this effect equals the product of the mechanical effect and $\omega(\eta_{K_C,\omega} + \eta_{r,\omega})$. Naturally, it is proportional to the tax wedge ω since this wedge determines how much revenue is lost when income is taxed at the lower personal income tax rate instead of at the effective corporate tax rate. The behavioral effect is also proportional to the reduction in the corporate tax base due to a reduction in corporate capital $\eta_{K_C,\omega} < 0$ and due to the change in the interest rate $\eta_{r,\omega}$.

Finally, the third component, which we call the 'misallocation' effect, captures that gross income decreases, reducing the overall tax base. As discussed, the output loss due to increased misallocation is partially offset by the saving on wasteful incorporation and equity issuance costs, which are accounted for in this term.

3.5 Equilibrium Effects in the Frictionless Benchmark

To understand the incidence of the corporate tax, it is useful to first consider the frictionless benchmark, in which the existing tax wedge is zero and there are no costs of incorporation or equity issuance. As we show below, in this idealized scenario the corporate tax incidence is fully on capital, as in Harberger (1962).

To explain the mechanism, we first characterize the equilibrium allocation. The following corollary summarizes Propositions 1 to 4 for the special case when $\omega = \mu = \kappa = 0$.

Corollary 1. ***Equilibrium Effects in the Frictionless Benchmark.*** *Let Assumption 2 be satisfied and assume additionally that $\omega = \mu = \kappa = 0$. Then the following results hold.*

1. *The changes in the equilibrium wage and interest rate due to a marginal increase in the tax wedge $d\omega > 0$ are given by, respectively,*

$$\eta_{w,\omega} = 0 \qquad \text{and} \qquad \eta_{r,\omega} = -\frac{Y_C}{Y}\lambda.$$

2. *The changes in managerial compensation in C corporations and unconstrained pass-through businesses due to a marginal increase in the tax wedge $d\omega > 0$ are given by, respectively,*

$$\eta_{w^m_C,\omega} = -\frac{\alpha_k}{\alpha_m}\frac{Y_{P_u}}{Y}\lambda < 0 \qquad \text{and} \qquad \eta_{w^m_{P_u},\omega} = \frac{\alpha_k}{\alpha_m}\frac{Y_C}{Y}\lambda > 0.$$

3. *The change in aggregate gross income due to a marginal increase in the tax wedge $d\omega > 0$ is zero, that is*

$$\eta_{\tilde{Y},\omega} = \eta_{Y,\omega} = 0.$$

4. *The change in government revenue due to a marginal increase in the total tax rate on corporate profits $d\tau_{\tilde{c}} > 0$ is given by*

$$\eta_{R,\tau_{\tilde{c}}} = \frac{\tilde{r}^e \lambda K_C}{R} > 0.$$

The first part summarizes the changes in wages and in the interest rate. In the frictionless benchmark all firms face identical relative factor prices; thus, their capital-labor ratio are identical, $\frac{L_C}{L_C+L_{P_u}} - \frac{K_C}{K_C+K_{P_u}} = 0$. This implies that the reallocation of capital has no first-order effect on the wage as the labor released from C corporations is fully absorbed by pass-throughs. In turn, this implies that the response of the interest rate is proportional to $\tilde{\eta}_{q,\omega} = \lambda$, and that there is no feedback effect through the labor market.

The second part summarizes the effect on managerial compensation. Without frictions, there are no constrained pass-throughs. While employees' wages are not changing, managerial compensation is affected via the reduction in the interest rate and, directly, via the increased cost of capital at C corporations. The former affects both types of entrepreneurs equally, while only owner-managers of C corporations are affected by the latter. Since the interest rate decline does not fully offset the direct financing cost increase in C corporations, we have that $\eta_{w^m_C,\omega<0} < 0 < \eta_{w^m_{P_u},\omega}$; i.e., managerial remuneration in C corporations declines while it increases in unconstrained pass-throughs. As we discuss below, aggregate net managerial income does not change.

The third part of the corollary states that the output loss is zero. Since the marginal product of each production factor is equalized across all firms the reallocation of capital and labor does not have a first order effect on output. Absent other costs this in turn implies that gross income is unchanged as well.

Finally, the fourth part captures the effect of a corporate tax increase on government revenue. In this frictionless special case, this effect consists exclusively of the mechanical effect, which is unambiguously positive. The misallocation term is zero, implied by the previous paragraph. Moreover, the behavioral effect is zero as well since, absent an existing tax wedge $\omega = 0$, the part of production which relocates from C corporations to unconstrained pass-throughs is taxed at the same rate.

4 The Incidence of Corporate Taxes

In the previous section we analytically characterized the effects of changes in the tax wedge on factor prices, managerial income, output, and government revenue. In this section, we study the incidence of the corporate tax—i.e., who bears the burden of a tax increase. Formally, we define the incidence of a tax increase that falls on a particular agent as her consumption loss as a fraction of the average consumption loss in the economy. Aggregate consumption is equal to aggregate net income defined as

$$\tilde{Y}_{net} \equiv \tilde{Y} - R.$$

The formal definition is as follows:

Definition 1. ***Corporate Tax Incidence on Individuals.*** *The share of corporate tax incidence borne by agent (a, θ, ν) is the change in her net income (consumption) due to an increase in the total tax rate on corporate profits $d\tau_{\tilde{c}}$, relative to the change in average net income $\tilde{Y}_{net}$,*

$$I_{\tau_{\tilde{c}}}(a, \theta, \nu) = \frac{\frac{dc(a,\theta,\nu)}{d\tau_{\tilde{c}}}}{\frac{d\tilde{Y}_{net}}{d\tau_{\tilde{c}}}}.$$

In line with the literature we also define the incidence that falls on the various production factors as follows.[17]

Definition 2. ***Corporate Tax Incidence on Production Factors.*** *The shares of corporate tax incidence borne by each production factor (capital, labor and management) are, respectively,*

$$I^K_{\tau_{\tilde{c}}} = \frac{d\left[(1-\tau_i)rK\right]}{d\tau_{\tilde{c}}} \frac{1}{\frac{d\tilde{Y}_{net}}{d\tau_{\tilde{c}}}}, \quad I^L_{\tau_{\tilde{c}}} = \frac{d\left[(1-\tau_i)wL\right]}{d\tau_{\tilde{c}}} \frac{1}{\frac{d\tilde{Y}_{net}}{d\tau_{\tilde{c}}}} \quad \text{and} \quad I^M_{\tau_{\tilde{c}}} = 1 - I^K_{\tau_{\tilde{c}}} - I^L_{\tau_{\tilde{c}}}.$$

4.1 Corporate Tax Incidence in the Absence of Misallocation

We first characterize the corporate tax incidence if there is no misallocation. In this special case we can characterize the incidence analytically.

17 The precise definition of tax incidence differs slightly across studies. Our definition is analogous, for example, to the one in Feldstein (1974), who also explicitly accounts for the change in the deadweight loss.

Corollary 2. ***Corporate Tax Incidence in First Best Allocation.*** *Suppose Assumption 2 is satisfied and, in addition, $\omega = \mu = \kappa = 0$. Then the incidence of corporate taxes on capital, labor, and management is given by*

$$I^K_{\tau_{\tilde{c}}} = 1, \qquad I^L_{\tau_{\tilde{c}}} = 0, \qquad \textit{and} \qquad I^M_{\tau_{\tilde{c}}} = 0;$$

i.e., the incidence falls fully on capital. Furthermore, for each marginal dollar of tax revenue, $\frac{Y_{P_u}}{Y}$ dollars are redistributed from owners of C corporations to owners of (unconstrained) pass through businesses.

We have shown in the previous section that in the absence of frictions an increase in corporate taxes does not have a first order effect on aggregate gross income. Hence, the change in net income is simply the negative change in revenue. As we have explained above, the increase in the corporate tax raises the cost of capital for C corporations; thus, some capital and labor is reallocated to pass-throughs. To restore equilibrium in the capital market, the (pre-tax) interest rate needs to decline; however, this reallocation does not affect, at the margin, the aggregate productivity of the economy. Therefore, wages and output remain unchanged. As a consequence, the revenue increase is financed in full by the owners of capital as in Harberger (1962).

It is important to note that the incidence on managers is not homogeneously equal to zero but only in the aggregate. We have already shown that the remuneration of C corporation owners drops while pass-through owners gain in this case. In fact, these losses and gains exactly offset each other, such that the respective incidence is given by

$$I^{M_C}_{\tau_{\tilde{c}}} = \frac{Y_{P_u}}{Y} \qquad \text{and} \qquad I^{M_{P_u}}_{\tau_{\tilde{c}}} = -\frac{Y_{P_u}}{Y}.$$

The decline in the interest rate lowers the cost of capital and hence increases managerial compensation in pass-through businesses. The direct increase in the cost of capital in C corporations is only partially offset by the drop in the interest rate. Specifically, from Corollary 1 we know that

$$\eta_{r,\tau_{\tilde{c}}} = -\frac{Y_C}{Y}\tilde{\eta}_{q,\tau_{\tilde{c}}} > -\tilde{\eta}_{q,\tau_{\tilde{c}}}$$

This results in redistribution from the owners of C corporations to the owners of pass-through businesses. The total amount of this redistribution depends on the relative share of output produced in the two firm types.

4.2 Corporate Tax Incidence in the Presence of Misallocation

We proceed to the analysis of tax incidence when the initial allocation of production factors is inefficient. We do not impose Assumption 2 and allow for changes in occupation and organizational form in response to tax changes. As we have discussed above, we cannot analytically sign some of the key elasticities; hence, we rely on a calibrated numerical exercise for the rest of paper.

Following Auerbach (2018)'s estimate for the U.S. economy, we set the tax wedge to $\omega = 0.058$; thus, C corporations are taxed at a higher rate than pass-throughs. We approximate the joint distribution of wealth, working and managerial ability using a joint log-normal distribution with Pareto tails, and chose its parameters to match the empirical distributions of wealth and income across workers and business owners. Then, we jointly calibrate a total of six parameters relating to technology and financial frictions to match six corresponding moments describing income shares across production factors and organizational forms. The targeted income shares are precisely the moments that matter for the response of the economy to a change in taxation, as we discussed in the preceding section. In particular, to match the small number and large average size of C corporations, we need both a positive fixed incorporation cost ($\kappa = 0.96$) and a positive equity issuance cost ($\mu = 0.50$). Appendix C contains calibration details.

The right panel of Figure 5 depicts, for agents with mean labor productivity ν, their occupational and organizational choices (W, C, P_c and P_u) as functions of their entrepreneurial ability (x-axis) and their wealth (y-axis). For comparison, the left panel shows the occupations and organizational forms in the first best allocation; i.e., when $\omega = \mu = \kappa = 0$ and all other parameters are unchanged. In the first best allocation, occupational choice is independent of wealth. Entrepreneurs who need to issue outside equity form a C corporation. Otherwise, they form an unconstrained pass-through. In the absence of frictions, there are no constrained pass-throughs.

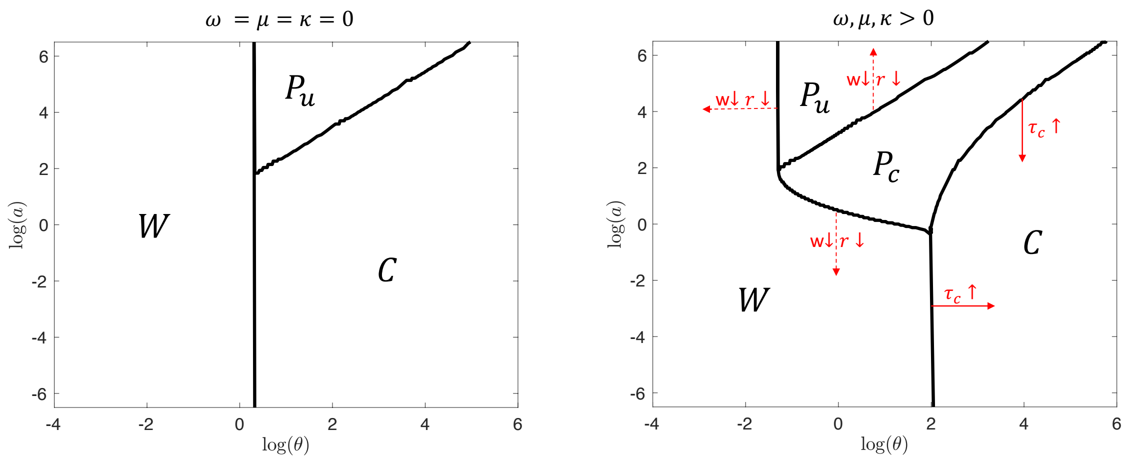

Figure 5: Occupation and Organizational Forms

The equilibrium in the case we are considering, where there is a positive tax wedge and financial frictions, is depicted in the right panel. We see some significant differences in the choice of occupations and organizational forms, relative to the first-best allocation. Some agents, who would choose to form a C corporation in the first best, given the higher funding costs in these firms, decide instead to become workers or to operate a constrained pass-through business. Furthermore, some agents who are workers in the first best decide to run a (constrained or unconstrained) pass-through business, due to the lower equilibrium wage and interest rate. There is misallocation of talent as the occupational choice depends on wealth. Furthermore, there is misallocation of capital among businesses. In Figure 5, this is visible in the appearance of an area of constrained pass-throughs (P_c). This is given by firms which in the first best were unconstrained pass-throughs (and operated at a smaller scale) or C corporations (operating at a larger scale). Moreover, as discussed above, all C corporations, including infra-marginal ones, choose to produce at a lower scale relative to the first best, as they face higher effective capital costs.

We study the effects of a one percentage point increase in the tax rate on corporate profits. The red arrows in Figure 5 indicate the direction of change of the thresholds, in terms of wealth and entrepreneurial ability, for the different occupational and organizational choices, when the corporate tax is increased. As discussed in the previous section, it becomes less attractive to form a C corporation. Furthermore, in equilibrium factor prices decline, which increases the attractiveness of operating a pass-through business, relative to being a worker.

Direct Change in Cost of Corporate Capital. The corporate tax hike directly increases the marginal cost of corporate capital by

$$\tilde{\eta}_{q,\omega} = \frac{\lambda}{1 + \lambda(\omega + \mu)} = 0.35;$$

i.e., a one percentage point increase in the tax rate on corporate profits increases the cost of capital by 0.35 percent.

Factor Price Responses. The initial misallocation of production factors implies that a marginal increase in corporate taxes, shifting capital to unconstrained pass-throughs with lower productivity of capital, reduces labor productivity. Thus, both equilibrium interest rate and wages fall. Applying the results in Proposition 1, we can decompose the factor price responses into an intensive margin term—capturing equilibrium adjustments when holding occupation and organizational form fixed—as well as extensive margin terms—capturing the effects of switches in occupation and organizational form.

Table 1 reports this decomposition. A one percentage point increase in the corporate tax induces a reduction of the wage rate by 0.054%. Most (94%) of that effect is due to the increase in misallocation of production factors along the intensive margin. While the various extensive margin effects are relatively sizable as well, they have different signs, as some C corporation owners become workers in response to the increase in the tax wedge, and some workers start a pass-through business. Therefore, the cumulative extensive margin effect is rather small.

Furthermore, the interest rate falls by 0.21%, entirely due to the equilibrium adjustment

Table 1: Semi-elasticities of factor prices to corporate tax increase

Total Response	Intensive Margin	Extensive Margin			
		$\overrightarrow{CP_c}$	$\overrightarrow{CW}$	$\overrightarrow{WP_c}$	$\overrightarrow{WP_u}$
Wage					
-0.0539	-0.0503	-0.0047	-0.0294	0.0254	0.0053
100.0%	93.5%	8.8%	54.7%	-47.1%	-9.8%
Interest rate					
-0.2110	-0.2774	-0.0079	-0.0154	0.0288	0.0609
100.0%	131.5%	3.8%	7.3%	-13.6%	-28.9%

of the interest rate when holding occupation and organizational form fixed. The flow of workers into pass-throughs, facing a lower marginal cost of capital, moderates the decline in capital demand.

Output Response. The increase in misallocation caused by the one percentage point increase in the tax wedge leads to a slight reduction in gross income ($\tilde{Y}$) of 0.003%. This number suggests that misallocation is small. However, as Table 2 shows, building on Proposition 3, this small value is the result of larger offsetting effects: while output Y decreases by 0.106%, the flow away from C corporations triggers an almost completely offsetting reduction in incorporation (-0.011%) and equity issuance costs (-0.092%). In this sense, while net misallocation is small, misallocation in terms of gross output Y is substantial. This distinction is important in particular because it is the latter that matters for the wage and interest rate response.

Table 2: Semi-elasticity of gross income to corporate tax increase

Total Response	Output (Y)	Incorporation (κC)	Equity issuance ($\mu r E^o$)
-0.003	-0.106	0.011	0.092

Tax Revenue Response. Following Proposition 4, Table 3 decomposes the total response of tax revenue (0.198%) into a mechanical increase in revenue associated with a one percentage point higher tax on corporate profits of 0.223%, a behavioral effect capturing the reallocation of income across tax bases (-0.023%), as well as a reduction in total income resulting from increased misallocation (-0.003%). Thus, combining the latter two effects, tax revenue increases by about 13% less than the direct effect.

Aggregate Net Income Response. Aggregate net income declines by 0.06%, reflecting the changes in gross income and tax revenue.

Tax Incidence. We proceed to disaggregate the incidence of the corporate tax in Ta-

Table 3: Semi-elasticity of tax revenue to corporate tax increase

Total Response	Mechanical	Behavioral	Misallocation
0.198	0.223	-0.023	-0.003
100.0%	112.8%	-11.5%	-1.3%

ble 4. The upper panel decomposes the incidence into the three factors of production. A one percentage point increase in the corporate tax reduces aggregate (post-tax) capital income by 0.21%. Reported as a fraction of the change in aggregate net income, the incidence of the tax on capital—that is, the net change in capital income divided by the net change in aggregate income—equals 83.2%. Hence, we find that in our calibrated economy with financial frictions and a positive tax wedge, the incidence on capital is not far from the benchmark of a 100% incidence on capital, which obtains in the first best (Corollary 2). However, contrary to the case where there is no factor misallocation prior to the tax increase, we find an equally large incidence on labor of 83.9%, which is partially offset by a -67.1% incidence on management: for every dollar of aggregate net income lost in response to the tax hike, managers gain 67 cents on net. Even though the tax hike increases the cost of capital for C corporations, which reduces their managers' net income, this direct effect is more than offset in equilibrium by the fall in wages and interest rates. The latter, indirect, equilibrium effect raises in particular the income of pass-through managers who take advantage of lower factor prices, and mitigates the income loss of managers of C corporations. Note that pass-through entrepreneurs gain also in the frictionless benchmark; however, their gains are exactly offset by the loss of C corporation owners. With frictions, the decline in wages shifts a large part of the burden from managers to workers so that the managerial sector as a whole becomes a net beneficiary of the tax hike. Moreover, the fall in wages also shifts some burden from capital owners to workers (see equation (10)).

Table 4: Incidence of corporate tax by production factor and occupation

By production factor:	Capital	Labor	Management	
	0.832	0.839	-0.671	
By initial occupation:	Workers	C-corp. owners	P_c owners	P_u owners
Aggregate incidence	0.909	0.473	-0.344	-0.039
Population share	0.889	0.006	0.080	0.026
Per capita incidence	1.023	86.036	-4.275	-1.518

That the burden of the tax increase is not born uniformly within production factors is also apparent in the lower panel of Table 4: The owners of C corporations lose 47 cents of net income for every dollar of aggregate net income loss. While they benefit from lower factor prices, the direct negative effect of a higher cost of corporate capital dominates. By contrast, the owners of pass-throughs altogether gain as they benefit from lower factor prices while not suffering from a higher tax burden. The effect on total net income of workers is comparable to the effect on labor, which is their main source of income. In addition, workers' capital income also falls, so that their overall net income declines by 91 cents for every dollar of aggregate net income loss.

Per capita, income changes are much higher in absolute terms for entrepreneurs, who constitute a small fraction of the overall population. Every dollar of aggregate per capita net income loss in response to the corporate tax increase generates on average a net income loss of $86 for each C corporation owner, while constrained pass-through owners gain $4.3 and unconstrained pass-through owners gain $1.5. Yet, even on a per capita basis, the average worker loses $1.02 per dollar of aggregate net income loss—that is, the average worker is slightly more negatively affected by the tax hike than the average individual in the economy.

4.3 Discussion

Comparison to Income Tax Increase. It is useful to consider in our framework also the incidence of the personal income tax τ_i and compare it with our findings on the incidence of the corporate tax. As Table 5 below shows, in our calibrated economy a marginal increase in the income tax falls on each factor of production roughly in proportion to its income share. In other words, the effective incidence of the income tax is close to the statutory incidence; i.e., the burden is roughly shared in the way it would be if agents' behavior was not affected by the tax increase. While the income tax hike decreases the tax wedge and improves allocative efficiency in the economy—opposite to the effect of a corporate tax increase—the incidence is not symmetric. Instead, the direct effect of an income tax increase dominates. Intuitively, this is because the income tax directly affects all factors of production in similar proportion. As shown in the bottom panel of Table 5, C corporation owners are the only ones that altogether benefit from an income tax increase. Unconstrained pass-through owners are most negatively affected, as both their income tax rate is going up, and in addition wages and the interest rate increase due to the reduction in misallocation.

Dynamics. Our model conforms with the "traditional view" in Public Finance, according to which the marginal investment of C corporations needs to be financed by new equity issuances (Feldstein, 1970; Poterba and Summers, 1983). While this assumption describes well firms at early stages of their life-cycle, mature firms may be better described by the "new view" , according to which marginal investment is financed via retained earnings (King, 1977; Auerbach, 1979; Bradford, 1981). Our static environment cannot capture the fact that mature C corporations are affected differently by tax changes relative to new entrants. Thus, the allocative effects of taxes in our framework

Table 5: Incidence of income tax by production factor and occupation

By production factor:	Capital	Labor	Management	
	0.277	0.624	0.099	

By initial occupation:	Workers	C-corp. owners	P_c owners	P_u owners
Aggregate incidence	0.805	-0.007	0.107	0.096
Population share	0.889	0.006	0.080	0.026
Per capita incidence	0.905	-1.345	1.335	3.745

should be interpreted as the ones occurring in the long-run, in which all (potential) business owners base their decisions on the set of taxes they expect to face over their lifetime. Furthermore, in our static environment the capital stock is fixed. In a dynamic environment, higher corporate taxes distort capital accumulation, reducing wages further over time. This tends to magnify the share of the corporate tax incidence borne by labor (Feldstein, 1974). In this sense, our estimates on the share of the tax burden born by labor are conservative.

5 Conclusion

In this paper we study the effects of corporate tax changes in a rich general equilibrium framework, where (i) occupational choice, (ii) firms' organizational form, and (iii) the financing structure of corporate investment are all endogenous. We analytically disentangle the various effects of corporate taxes on (i) factor remuneration, (ii) gross income, and (iii) government revenue. Contrary to the standard result (Harberger, 1962), we find that a large share of the corporate tax incidence is borne by labor because the tax change induces increased misallocation of capital and talent, and that implies lower productivity of labor and ultimately lower wages. Quantitatively, the decrease in the investment of inframarginal C corporations triggered by the tax rise turns out to be the biggest contributor to the wage reduction.

To the best of our knowledge this is the first study to incorporate all the relevant effects mentioned above into a coherent framework of corporate tax incidence. The static nature of our model allows to clearly highlight the various channels affecting the incidence shares. Yet, it abstracts from transitional elements of corporate tax reforms as well as from their effect on capital accumulation and on the intensive margin of labor supply. Accounting for all these key decisions in a fully fledged dynamic and stochastic model that encompasses, in addition to the margins of the present paper, a realistic life-cycle of firms should be the next step in this important research agenda.

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A Proofs

A.1 Proof of Lemma 1

Proof. Consider a single C corporation that pays out dividend r^e and let r^s be the dividend paid out by all other C corporations. First, we show that if $(1-\tau_d)r^s = (1-\tau_i)r$, then outside equity is positive ($e^o > 0$) only if inside equity equals the entrepreneur's endowment ($e^i = a$).

By contradiction, assume that in the optimum $e^o > 0$ but $e^i < a$. Without loss of generality we can assume that the entrepreneur invested in bonds any wealth that she did not invested in her own firm, i.e. $b = a - e^i$. A marginal variation $de^i = -db = -de^o > 0$ changes the entrepreneur's consumption by

$$dc = \left[(1-\tau_i)(\mu r - r) + (1-\tau_d)r^e\right]de^i.$$

Now $e^o > 0$ can only be if $(1-\tau_d)r^e \geq (1-\tau_i)r$. Otherwise outside investors would not be willing to invest in equity of the firm. As a consequence $dc > 0$, contradicting optimality of the original choice.

Second, we show that if $(1-\tau_d)r^s = (1-\tau_i)r$ and if outside equity is positive ($e^o > 0$), then the optimal dividend payment is given by $r^e = r^s = (1-\tau_i)r/(1-\tau_d)$. We already showed that if $e^o > 0$ we have $e^i = a$ and therefore $b = 0$.

Now assume again by contradiction that $r^e \neq (1-\tau_i)r/(1-\tau_d)$.

If $r^e < (1-\tau_i)r/(1-\tau_d)$ outside investors would never be willing to invest in equity of the firm and hence $e^o = 0$, a contradiction.

Now consider the case $r^e > (1-\tau_i)r/(1-\tau_d)$. This can be optimal only if

$$\frac{e^i}{e^i + e^o} \geq \frac{1-\tau_i}{(1-\tau_d)(1-\tau_c)}.$$

In this case entrepreneurs would set their wage payment to zero and increase r^e to the maximum.

Assume first that the leverage constraint is binding at the optimum, i.e. $k = (a + e^o)/\lambda$. Then

$$r^e(k) = \frac{(1-\tau_c)}{\lambda}\left[\frac{F(k, l(k,\theta), \theta)}{k} - \delta - \frac{wl(k,\theta)}{k} - r(1-\lambda) - \mu r\left(\lambda - \frac{a}{k}\right)\right].$$

Net income of the entrepreneur would then be given by $I(k) := (1-\tau_d)r^e(k)a$. Its derivative with respect to k is given by

$$\begin{aligned} I'(k) &= (1-\tau_d)(1-\tau_c)a\frac{F_k(k, l(k,\theta), \theta)k - F(k, l(k,\theta), \theta) + wl(k,\theta) - \mu a}{\lambda k^2} \\ &= -(1-\tau_d)(1-\tau_c)a\frac{F_m(k, l(k,\theta), \theta)\theta + \mu a}{\lambda k^2} < 0, \end{aligned}$$

where the second equality follows from homogeneity of $F(.)$ and the fact that optimal labor input is implicitly given by $F_l(k, l(k,\theta), \theta) = w$. Hence, as long as $e^o > 0$ it is optimal to reduce the capital stock. We have established that it cannot be optimal to simultaneously have $r^e > (1 - \tau_i)r/(1-\tau_d)$ and $e^o > 0$ when the leverage constraint is binding.

Now assume that the leverage constraint is slack, i.e. $k < (a + e^o)/\lambda$. In this case

$$\begin{aligned} r^e(e^o) &= \frac{(1-\tau_c)}{e^i + e^o}\left[F(k, l(k,\theta), \theta) - \delta k - wl(k,\theta) - r(k - e^i - e^o) - \mu r e^o - \kappa\right] \\ &= \frac{(1-\tau_c)}{e^i + e^o}\left[F(k, l(k,\theta), \theta) - \delta k - wl(k,\theta) - rk\right] + (1-\tau_c) - (1-\tau_c)\mu r \frac{e^o}{e^i + e^o} \end{aligned}$$

and net income as a function of outside equity is given by $I(e^o) = (1-\tau_d)r^e(e^o)a$. It is easy to see that $I'(e^o) < 0$. Hence as long as the leverage constraint is slack, it is optimal to reduce outside equity until the leverage constraint binds. However, we have already established that for a binding leverage constraint simultaneously having $r^e > (1-\tau_i)r/(1-\tau_d)$ and $e^o > 0$ cannot be optimal. Thus we must have that $e^i = a$, $k = \frac{a + e^o}{\lambda}$ and $r^e = \frac{(1-\tau^i)r}{1-\tau_d}$. This completes the proof. □

A.2 Proof of Proposition 1

Proof. The equilibrium is given by equations in the two factor prices r, and w as well as in the variables $\{(k_C(\theta), k_{P_u}(\theta), l_C(\theta), l_{P_u}(\theta), \{l_{P_c}(a,\theta)\}_{a \in (\underline{a}(\theta), \lambda k_{P_u}(\theta))}, \underline{a}(\theta), \{\tilde{\nu}(a,\theta)\}_{a \in [0, \lambda k_{P_u}(\theta))},$ $\tilde{\nu}_{P_u}(\theta))\}_{\theta \in [0,\infty)}$, where $\underline{a}(\theta)$ denotes the asset level at which entrepreneurs with productivity θ are indifferent between forming a C corporation or a pass-through, $\tilde{\nu}(a,\theta)$ for $a \in [0, \lambda k_{P_u}(\theta)]$ are the working abilities at which agents with managerial abilities θ and wealth a are indifferent between working or being an entrepreneur, and $\tilde{\nu}_{P_u}(\theta)$ is the working ability at which agents with entrepreneurial ability θ and assets high enough to be unconstrained are indifferent between working and being and entrepreneur.

The equilibrium conditions are the firm's optimal factor demand decisions, that is for all $\theta \in [0, \infty)$

$$\begin{aligned} F_k(k_C(\theta), l_C(\theta), \theta) &= r(1 + \lambda\tilde{\omega}) \\ F_k(k_{P_u}(\theta), l_{P_u}(\theta), \theta) &= r \\ F_l(k_C(\theta), l_C(\theta), \theta) &= w \\ F_l(k_{P_u}(\theta), l_{P_u}(\theta), \theta) &= w \\ \forall a \in (\underline{a}, \lambda k_{P_u}) \quad F_l\left(\frac{a}{\lambda}, l_{P_c}(a,\theta), \theta\right) &= w, \end{aligned}$$

the market clearing conditions for capital

$$\int_0^\infty \left[k_C(\theta)\int_0^{\underline{a}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{\nu}_C(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da + \int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \frac{a}{\lambda}\Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_c}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da \right.$$
$$\left. + k_{P_u}(\theta)\int_{\lambda k_{P_u}(\theta)}^\infty \Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_u}(\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da\right]\gamma_\theta(\theta)d\theta = K$$

and labor

$$\int_0^\infty \left[l_C(\theta) \int_0^{\underline{a}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{\nu}_C(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da + \int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} l_{P_c}(a,\theta)\Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_c}(a)|a,\theta)\gamma_{a|\theta}(a|\theta)da \right.$$
$$\left. + l_{P_u}(\theta) \int_{\lambda k_{P_u}(\theta)}^\infty \Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_u}|a,\theta)\gamma_{a|\theta}(a|\theta)da \right] \gamma_\theta(\theta)d\theta$$
$$= \int_0^\infty \left[\int_0^{\lambda k_{P_u}(\theta)} \int_{\tilde{\nu}(a,\theta)}^\infty \nu\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da + \int_{\lambda k_{P_u}(\theta)}^\infty \int_{\tilde{\nu}_{P_u}(\theta)}^\infty \nu\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da \right] d\theta,$$

the condition that characterizes for each θ the asset level $\underline{a}(\theta)$, at which agents are indifferent between forming a C corporation and a (constrained) pass-through,

$$\forall \theta \in [0,\infty) \qquad F(k_C(\theta), l_C(\theta), \theta) - F\Big(\frac{\underline{a}(\theta)}{\lambda}, l_{P_c}(\underline{a}(\theta),\theta),\theta\Big) - r\left[k_C(\theta)(1+\lambda\tilde{\omega}) - \frac{\underline{a}(\theta)}{\lambda}\right]$$
$$= w\left[l_C(\theta) - l_{P_c}(\underline{a}(\theta),\theta)\right] + \mu r\underline{a}(\theta) + \kappa,$$

as well as the conditions that characterize for each θ and each a the working ability thresholds at which agents are indifferent between working and forming a, respectively, C corporation, constrained pass-through, and unconstrained pass-through, that is for each $\theta \in [0,\infty)$

$$\forall a \in [0, \underline{a}(\theta)) \quad F(k_C(\theta), l_C(\theta), \theta) - wl_C(\theta) - rk_C(\theta)(1+\lambda(\omega+\mu)) + \mu ra - \kappa = w\tilde{\nu}_C(a,\theta)$$
$$\forall a \in [\underline{a}, \lambda k_{P_u}) \quad F\Big(\frac{a}{\lambda}, l_{P_c}(a,\theta),\theta\Big) - wl_{P_c}(a,\theta) - r\frac{a}{\lambda} = w\tilde{\nu}_{P_c}(a,\theta)$$
$$F(k_{P_u}(\theta), l_{P_u}(\theta), 1) - wl_{P_u}(\theta) - rk_{P_u}(\theta) = w\tilde{\nu}_{P_u}.$$

Implicitly deriving the first order conditions for factor demand with respect to the tax wedge gives for all $\theta \in [0,\infty)$

$$\begin{aligned}
F_{kk}(k_C(\theta), l_C(\theta), \theta)\frac{dk_C(\theta)}{d\omega} + F_{kl}(k_C(\theta), l_C(\theta), 1)\frac{dl_C(\theta)}{d\omega} &= \frac{dr}{d\omega}(1+\lambda\tilde{\omega}) + r\lambda \\
F_{kk}(k_{P_u}(\theta), l_{P_u}(\theta), \theta)\frac{dk_{P_u}(\theta)}{d\omega} + F_{kl}(k_{P_u}(\theta), l_{P_u}(\theta), \theta)\frac{dl_{P_u}(\theta)}{d\omega} &= \frac{dr}{d\omega} \\
F_{kl}(k_C(\theta), l_C(\theta), \theta)\frac{dk_C(\theta)}{d\omega} + F_{ll}(k_C(\theta), l_C(\theta), \theta)\frac{dl_C(\theta)}{d\omega} &= \frac{dw}{d\omega} \\
F_{kl}(k_{P_u}(\theta), l_{P_u}(\theta), \theta)\frac{dk_{P_u}(\theta)}{d\omega} + F_{ll}(k_{P_u}(\theta), l_{P_u}(\theta), \theta)\frac{dl_{P_u}(\theta)}{d\omega} &= \frac{dw}{d\omega} \\
F_{ll}\Big(\frac{a}{\lambda}, l_{P_c}(a,\theta), 1\Big)\frac{dl_{P_c}(a,\theta)}{d\omega} &= \frac{dw}{d\omega},
\end{aligned}$$

where the last equation holds for all $a \in [\underline{a}(\theta), \lambda k_{P_u}(\theta)]$. This last equation is the total derivative of the condition that determines optimal labor demand of constrained pass-throughs. Since these firms effectively only choose labor, their capital being fixed at the maximum they can get given their assets, there is for all θ and all $a \in [\underline{a}, \lambda k_{P_u}(\theta)]$ a one to one relation between $\frac{dl_{P_c}(a,\theta)}{d\omega}$ and $\frac{dw}{d\omega}$.

Before stating the total derivatives of the factor market clearing conditions, it turns out convenient to define for each θ the share of agents with entrepreneurial ability θ who form a C corporation, a constrained pass-through, or a unconstrained pass through, respectively, by

$$
\begin{aligned}
C(\theta) &= \int_0^{\underline{a}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{v}_C(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da\gamma_{a|\theta}(a|\theta)da, \\
P_c(\theta) &= \int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{v}_{P_c}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da, \\
P_u(\theta) &= \int_0^{\infty}\int_{\lambda k_{P_u}(\theta)}^{\infty} \Gamma_{\nu|a,\theta}(\tilde{v}_{P_u}(\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da.
\end{aligned}
$$

Furthermore, one can decompose the derivatives of these shares with respect to ω. Specifically, the change in ability-θ agents who form a C corporation can be decomposed as

$$
\frac{dC(\theta)}{d\omega} = \underbrace{\int_0^{\underline{a}(\theta)} \gamma_{(a,\nu)|\theta}(a,\tilde{v}_C(a)|\theta)\frac{d\tilde{v}_C(a,\theta)}{d\omega}da}_{-\overrightarrow{CW}(\theta)} + \underbrace{\frac{d\underline{a}(\theta)}{d\omega}\Gamma_{\nu|a,\theta}(\underline{a},\tilde{v}_C(\underline{a}))\gamma_{a|\theta}(\underline{a}(\theta)|\theta)}_{-\overrightarrow{CP_c}(\theta)},
$$

where $\overrightarrow{CW}(\theta)$ are those who change occupation and $\overrightarrow{CP_c}(\theta)$ are those who change organizational form.

Similarly, the change in the share of ability-θ agents running an unconstrained pass-throughs is given by

$$
\frac{dP_u(\theta)}{d\omega} = \underbrace{\frac{d\tilde{v}_{P_u}(\theta)}{d\omega}\int_{\lambda k_{P_u}(\theta)}^{\infty} \gamma_{(a,\nu)|\theta}(a,\tilde{v}_{P_u}|\theta)da}_{\overrightarrow{WP_u}(\theta)} - \underbrace{\lambda\frac{dk_{P_u}(\theta)}{d\omega}\Gamma_{\nu|a,\theta}(\tilde{v}_{P_u}(\theta),\theta|\lambda k_{P_u}(\theta))\gamma_{a|\theta}(\lambda k_{P_u}(\theta)|\theta)}_{\overrightarrow{P_uP_c}(\theta)},
$$

the difference of those who change occupation $\overrightarrow{WP_u}(\theta)$ and those who (due the change in factor prices) are now constrained $\overrightarrow{P_uP_c}(\theta)$.

Finally, the change of ability-θ agents running a constrained pass-through business is given by the sum of three components,

$$
\begin{aligned}
\frac{dP_c(\theta)}{d\omega} = &\underbrace{-\frac{d\underline{a}(\theta)}{d\omega}\Gamma_{\nu|a,\theta}(\tilde{v}_C(\underline{a}(\theta)|\underline{a}(\theta),\theta))\gamma_{a|\theta}(\underline{a}(\theta)|\theta)}_{\overrightarrow{CP_c}(\theta)} + \underbrace{\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \gamma_{(a,\nu)|\theta}(a,\tilde{v}_{P_c}(a,\theta)|\theta)\frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega}da}_{\overrightarrow{WP_c}(\theta)} \\
&+ \underbrace{\lambda\frac{dk_{P_u}(\theta)}{d\omega}\Gamma_{\nu|a,\theta}(\tilde{v}_{P_u}(\theta)|\lambda k_{P_u}(\theta),\theta)\gamma_{a|\theta}(\lambda k_{P_u}(\theta)|\theta)}_{\overrightarrow{P_uP_c}(\theta)},
\end{aligned}
$$

those who change organizational form $\overrightarrow{CP_c}(\theta)$, those who change occupation $\overrightarrow{WP_c}(\theta)$ and those who are now constrained but were unconstrained pass-throughs before $\overrightarrow{P_uP_c}(\theta)$.

Similarly, the change in effective labor supply of agents with entrepreneurial ability θ can be decomposed as

$$\frac{dL(\theta)}{d\omega} = \underbrace{\int_0^{\underline{a}(\theta)} \frac{d\tilde{v}_C(a,\theta)}{d\omega} \tilde{v}_C(a,\theta)\gamma_{\nu|a,\theta}(\tilde{v}_C(a,\theta)|a,\theta)da}_{\bar{v}_{\overrightarrow{CW}}(\theta)\overrightarrow{CW}(\theta)}$$
$$+ \underbrace{\int_{\underline{a}}^{\lambda k_{P_u}(\theta)} \frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega} \tilde{v}_{P_c}(a,\theta)\gamma_{\nu|a,\theta}(\tilde{v}_{P_c}(a,\theta)|a,\theta)da}_{-\bar{v}_{\overrightarrow{WP_c}}(\theta)\overrightarrow{WP_c}(\theta)}$$
$$+ \underbrace{\tilde{v}_{P_u}(\theta)\int_{\lambda k_{P_u}(\theta)}^{\infty} \frac{d\tilde{v}_{P_u}(\theta)}{d\omega}\gamma_{\nu|a,\theta}(\tilde{v}_{P_u}(\theta)|a,\theta)da,}_{-\tilde{v}_{P_u}(\theta)\overrightarrow{WP_u}(\theta)}$$

where $\bar{v}_{\overrightarrow{CW}}(\theta)$ and $\bar{v}_{\overrightarrow{WP_c}}(\theta)$ denote the average labor productivity of agents with entrepreneurial ability θ who, in response to the increase in the tax wedge, switch from running C corporation to working, respectively from working to running a constrained pass-through.

Using all these definitions the total derivative of the capital market clearing condition can then be written as

$$\int_0^{\infty}\Bigg[\frac{dk_C(\theta)}{d\omega}C(\theta) - k_C(\theta)\overrightarrow{CW}(\theta) - \left(k_C(\theta) - \frac{\underline{a}(\theta)}{\lambda}\right)\overrightarrow{CP_c}(\theta)$$
$$+\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \frac{a}{\lambda}\gamma_{(a,\nu)|\theta}(a,\tilde{v}_{P_c}(a,\theta)|\theta)\frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega}da$$
$$+\frac{dk_{P_u}(\theta)}{d\omega}P_u(\theta) + k_{P_u}(\theta)\frac{d\tilde{v}_{P_u}}{d\omega}\overrightarrow{WP_u}(\theta)\Bigg]\gamma_\theta(\theta)d\theta = 0,$$

and the total derivative of the labor market clearing condition is given by

$$\int_0^{\infty}\Bigg[\frac{dl_C(\theta)}{d\omega}C(\theta) - (l_C(\theta) + \bar{v}_{\overrightarrow{CW}}(\theta))\overrightarrow{CW(\theta)} - \left(l_C(\theta) - l_{P_c}(\underline{a}(\theta),\theta)\right)\overrightarrow{CP_c}(\theta)$$
$$+\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \frac{dl_{P_c}(a,\theta)}{d\omega}\Gamma_{\nu|a,\theta}(\tilde{v}_{P_c}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da$$
$$+\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} l_{P_c}(a,\theta)\gamma_{(a,\nu)|\theta}(a,\tilde{v}_{P_c}(a,\theta)|\theta)\frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega}da$$
$$+\frac{dl_{P_u}(\theta)}{d\omega}P_u(\theta) + (l_{P_u}(\theta) + \tilde{v}_{P_u}(\theta))\overrightarrow{WP_u}(\theta)\Bigg]\gamma_\theta(\theta)d\theta = 0.$$

We use a Cobb-Douglas production function, that is

$$F(k,l,\theta) = k^{\alpha_k}l^{\alpha_l}\theta^{\alpha_m},$$

with $\alpha_k + \alpha_l + \alpha_m = 1$. Hence,

$$\begin{aligned}
F_k(k,l,\theta) =& \alpha_k k^{\alpha_k - 1} l^{\alpha_l} \theta^{\alpha_m}, \\
F_l(k,l,\theta) =& \alpha_l k^{\alpha_k} l^{\alpha_l - 1} \theta^{\alpha_m}, \\
F_{kk}(k,l,\theta) =& \alpha_k(\alpha_k - 1) k^{\alpha_k - 2} l^{\alpha_l} \theta^{\alpha_m}, \\
F_{ll}(k,l,\theta) =& \alpha_l(\alpha_l - 1) k^{\alpha_k} l^{\alpha_l - 2} \theta^{\alpha_m}, \\
F_{kl}(k,l,\theta) =& \alpha_k \alpha_l k^{\alpha_k - 1} l^{\alpha_l - 1} \theta^{\alpha_m}.
\end{aligned}$$

Denote by

$$\eta_{x,\omega} = \frac{d \log x}{d\omega}$$

the semi-elasticity of variable x with respect to the tax wedge ω.

Then the equations obtained from totally deriving the optimality conditions for factor demand become

$$\begin{aligned}
\alpha_k(\alpha_k - 1)(k_C(\theta))^{\alpha_k - 1}(l_C(\theta))^{\alpha_l}\theta^{\alpha_m}\eta_{k_C(\theta),\omega} + \alpha_k\alpha_l(k_C(\theta))^{\alpha_k - 1}(l_C(\theta))^{\alpha_l}\theta^{\alpha_m}\eta_{l_C(\theta),\omega} =& \eta_{r,\omega} r(1 + \lambda\tilde{\omega}) + r\lambda \\
\alpha_k(\alpha_k - 1)(k_{P_u}(\theta))^{\alpha_k - 1}(l_{P_u}(\theta))^{\alpha_l}\theta^{\alpha_m}\eta_{k_{P_u}(\theta),\omega} + \alpha_k\alpha_l(k_{P_u}(\theta))^{\alpha_k - 1}(l_{P_u}(\theta))^{\alpha_l}\theta^{\alpha_m}\eta_{l_{P_u}(\theta),\omega} =& \eta_{r,\omega} r \\
\alpha_k\alpha_l(k_C(\theta))^{\alpha_k}(l_C(\theta))^{\alpha_l - 1}\theta^{\alpha_m}\eta_{k_C(\theta),\omega} + \alpha_l(\alpha_l - 1)(k_C(\theta))^{\alpha_k}(l_C(\theta))^{\alpha_l - 1}\theta^{\alpha_m}\eta_{l_C(\theta),\omega} =& \eta_{w,\omega} w \\
\alpha_k\alpha_l(k_{P_u}(\theta))^{\alpha_k}(l_{P_u}(\theta))^{\alpha_l - 1}\theta^{\alpha_m}\eta_{k_{P_u}(\theta),\omega} + \alpha_l(\alpha_l - 1)(k_{P_u}(\theta))^{\alpha_k}(l_{P_u}(\theta))^{\alpha_l - 1}\theta^{\alpha_m}\eta_{l_{P_u}(\theta),\omega} =& \eta_{w,\omega} w \\
\alpha_l(\alpha_l - 1)\left(\frac{a}{\lambda}\right)^{\alpha_k}(l_{P_c}(a,\theta))^{\alpha_l - 1}\theta^{\alpha_m}\eta_{l_{P_c}(a,\theta),\omega} =& \eta_{w,\omega} w
\end{aligned}$$

Using the first order conditions these equations can be simplified to

$$(\alpha_k - 1)\eta_{k_C(\theta),\omega} + \alpha_l \eta_{l_C(\theta),\omega} = \eta_{r,\omega} + \frac{\lambda}{1 + \lambda\tilde{\omega}} \tag{A.1}$$

$$(\alpha_k - 1)\eta_{k_{P_u}(\theta),\omega} + \alpha_l \eta_{l_{P_u}(\theta),\omega} = \eta_{r,\omega} \tag{A.2}$$

$$\alpha_k \eta_{k_C(\theta),\omega} + (\alpha_l - 1)\eta_{l_C(\theta),\omega} = \eta_{w,\omega} \tag{A.3}$$

$$\alpha_k \eta_{k_{P_u}(\theta),\omega} + (\alpha_l - 1)\eta_{l_{P_u}(\theta),\omega} = \eta_{w,\omega} \tag{A.4}$$

$$(\alpha_l - 1)\eta_{l_{P_c}(a,\theta),\omega} = \eta_{w,\omega} \tag{A.5}$$

To simplify notation further, denote by

$$\bar{k}_{\overrightarrow{WP_c}}(\theta) = \frac{\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \frac{a}{\lambda}\gamma_{(a,\nu)|\theta}(a, \tilde{v}_{P_c}(a,\theta)|\theta)\frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega} da}{\overrightarrow{WP_c}(\theta)}$$

and

$$\bar{l}_{\overrightarrow{WP_c}}(\theta) = \frac{\int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} l_{P_c}(a,\theta)\gamma_{(a,\nu)|\theta}(a,\tilde{v}_{P_c}(a,\theta)|\theta)\frac{d\tilde{v}_{P_c}(a,\theta)}{d\omega}da}{\overrightarrow{WP_c}(\theta)},$$

respectively, the average capital and labor employed in constrained pass-throughs that are run by ability-θ entrepreneurs, who were workers before.

Furthermore, using equation (A.5) we can substitute out $\eta_{l_{P_c},\omega}(a,\theta)$ in the derivative of the labor market clearing condition. Hence, the total derivatives of the two factor market clearing conditions become

$$\int_0^\infty \Big[\eta_{k_C(\theta),\omega}k_C(\theta)C(\theta) - k_C(\theta)\overrightarrow{CW}(\theta) - \Big(k_C(\theta) - \frac{\underline{a}(\theta)}{\lambda}\Big)\overrightarrow{CP_c}(\theta) + \bar{k}_{\overrightarrow{WP_c}}\overrightarrow{WP_c}(\theta) + \eta_{k_{P_u}(\theta),\omega}k_{P_u}(\theta)P_u(\theta) + k_{P_u}(\theta)\overrightarrow{WP_u}(\theta)\Big]\gamma_\theta(\theta)d\theta = 0 \tag{A.6}$$

and

$$\int_0^\infty \Big[\eta_{l_C(\theta),\omega}l_C(\theta)C(\theta) - \Big(l_C(\theta) + \bar{v}_{\overrightarrow{CW}}(\theta)\Big)\overrightarrow{CW}(\theta) - \Big(l_C(\theta) - l_{P_c}(\underline{a}(\theta),\theta)\Big)\overrightarrow{CP_c}(\theta) - \frac{\eta_{w,\omega}}{1-\alpha_l}\bar{l}_{P_c}(\theta)P_c(\theta) + \Big(\bar{l}_{\overrightarrow{WP_c}(\theta)} + \bar{v}_{\overrightarrow{WP_c}}(\theta)\Big)\overrightarrow{WP_c}(\theta) + \eta_{l_{P_u}(\theta),\omega}l_{P_u}(\theta)P_u(\theta) + \Big(l_{P_u}(\theta) + \tilde{v}_{P_u}(\theta)\Big)\overrightarrow{WP_u}(\theta)\Big]\gamma_\theta(\theta)d\theta = 0, \tag{A.7}$$

where $\bar{l}_{P_c}(\theta)$ denotes the average labor demand of constrained pass-throughs that are run by entrepreneurs with ability θ.

Equation (A.3) is equivalent to

$$\eta_{l_C(\theta),\omega} = \frac{\alpha_k}{1-\alpha_l}\eta_{k_C(\theta),\omega} - \frac{1}{1-\alpha_l}\eta_{w,\omega}.$$

Plugging this into equation (A.1) gives

$$\eta_{k_C(\theta),\omega} \equiv \eta_{k_C,\omega} = -\frac{1}{\alpha_m}\Big[\alpha_l\eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega} + (1-\alpha_l)\frac{\lambda}{1+\lambda\tilde{\omega}}\Big] \equiv \eta_{k_C,\omega},$$

which if plugged in above gives

$$\eta_{l_C(\theta),\omega} = -\frac{1}{\alpha_m}\Big[(1-\alpha_k)\eta_{w,\omega} + \alpha_k\eta_{r,\omega} + \alpha_k\frac{\lambda}{1+\lambda\tilde{\omega}}\Big] \equiv \eta_{l_C,\omega}.$$

Observe that both are independent of θ, that is the relative change in factor demand in C corporations is invariant to the owner-manager's ability. Similarly,

$$\eta_{k_{P_u}(\theta),\omega} = -\frac{1}{\alpha_m}\left[\alpha_l \eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega}\right] \equiv \eta_{k_{P_u},\omega}$$

and

$$\eta_{l_{P_u}(\theta),\omega} = -\frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k \eta_{r,\omega}\right] \equiv \eta_{l_{P_u},\omega}.$$

Hence, also the relative change in factor demand in unconstrained pass-throughs is invariant to the owner-manager's ability.

Plugging these four equations into (A.6) and (A.7) gives

$$\begin{aligned}\int_0^\infty \Bigg[\frac{1}{\alpha_m}\left[\alpha_l\eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega} + (1-\alpha_l)\frac{\lambda}{1+\lambda\tilde{\omega}}\right]k_C(\theta)C(\theta) + k_C(\theta)\overrightarrow{CW}(\theta)\\ +\left(k_C(\theta) - \frac{\underline{a}(\theta)}{\lambda}\right)\overrightarrow{CP_c}(\theta) - \bar{k}_{\overrightarrow{WP_c}}(\theta)\overrightarrow{WP_c}(\theta) + \frac{1}{\alpha_m}\left[\alpha_l\eta_{w,\omega} - (1-\alpha_l)\eta_{r,\omega}\right]k_{P_u}(\theta)P_u(\theta)\\ -k_{P_u}(\theta)\overrightarrow{WP_u}(\theta)\Bigg]\gamma_\theta(\theta)d\theta = 0\end{aligned}$$

and

$$\begin{aligned}\int_0^\infty \frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k\eta_{r,\omega} + \alpha_k\frac{\lambda}{1+\lambda\tilde{\omega}}\right]l_C(\theta)C(\theta) + \left(l_C(\theta) + \bar{v}_{\overrightarrow{CW}}(\theta)\right)\overrightarrow{CW}(\theta)\\ +\left(l_C(\theta) - l_{P_c}(\underline{a}(\theta),\theta)\right)\overrightarrow{CP_c}(\theta) + \frac{\eta_{w,\omega}}{1-\alpha_l}\bar{l}_{P_c}(\theta)P_c(\theta) - \left(\bar{l}_{\overrightarrow{WP_c}(\theta)} + \bar{v}_{\overrightarrow{WP_c}}(\theta)\right)\overrightarrow{WP_c}(\theta)\\ +\frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k\eta_{r,\omega}\right]l_{P_u}(\theta)P_u(\theta) - \left(l_{P_u}(\theta) + \tilde{v}_{P_u}(\theta)\right)\overrightarrow{WP_u}(\theta)\Bigg]\gamma_\theta(\theta)d\theta = 0\end{aligned}$$

Collecting terms gives

$$\begin{aligned}\eta_{w,\omega}\frac{\alpha_l}{\alpha_m}(K_C + K_{P_u}) + \eta_{r,\omega}\frac{1-\alpha_l}{\alpha_m}(K_C + K_{P_u}) + \frac{1-\alpha_l}{\alpha_m}\frac{\lambda}{1+\lambda\tilde{\omega}}K_C\\ + \int_0^\infty k_C(\theta)\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta + \int_0^\infty \left(k_C(\theta) - \frac{\underline{a}(\theta)}{\lambda}\right)\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta\\ - \int_0^\infty \bar{k}_{\overrightarrow{WP_c}}(\theta)\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta - \int_0^\infty k_{P_u}(\theta)\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta = 0\end{aligned}$$

and

$$\begin{aligned}\eta_{w,\omega}\frac{\alpha_k\alpha_l + \alpha_m\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l)\alpha_m}(L_C + L_{P_u}) + \eta_{r,\omega}\frac{\alpha_k}{\alpha_m}(L_C + L_{P_u}) + \frac{\alpha_k}{\alpha_m}\frac{\lambda}{1+\lambda\tilde{\omega}}L_C\\ + \int_0^\infty \left(l_C(\theta) + \bar{v}_{\overrightarrow{CW}}(\theta)\right)\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta + \int_0^\infty (l_C(\theta) - l_{P_c}(\underline{a}(\theta),\theta))\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta\end{aligned}$$

$$-\int_0^\infty \left(\bar{l}_{\overrightarrow{WP_c}(\theta)} + \bar{v}_{\overrightarrow{WP_c}}(\theta)\right)\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta - \int_0^\infty \left(l_{P_u}(\theta) + \tilde{v}_{P_u}(\theta)\right)\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta = 0.$$

The two equations are equivalent to

$$\eta_{w,\omega}\frac{\alpha_l}{1-\alpha_l} + \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}}\frac{K_C}{K_C+K_{P_u}} + \frac{\alpha_m}{1-\alpha_l}\left[\frac{\int_0^\infty k_C(\theta)\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta}{K_C+K_{P_u}}\right.$$
$$+\frac{\int_0^\infty \left(k_C(\theta)-\frac{\underline{a}(\theta)}{\lambda}\right)\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta}{K_C+K_{P_u}} - \frac{\int_0^\infty \bar{k}_{\overrightarrow{WP_c}}(\theta)\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta}{K_C+K_{P_u}}$$
$$\left.-\frac{\int_0^\infty k_{P_u}(\theta)\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta}{K_C+K_{P_u}}\right] = 0$$

and

$$\eta_{w,\omega}\frac{\alpha_k\alpha_l + \alpha_m\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l)\alpha_k} + \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}}\frac{L_C}{L_C+L_{P_u}}$$
$$+\frac{\alpha_m}{\alpha_k}\left[\frac{\int_0^\infty \left(l_C(\theta)+\bar{v}_{\overrightarrow{CW}}(\theta)\right)\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}} + \frac{\int_0^\infty \left(l_C(\theta)-l_{P_c}(\underline{a}(\theta),\theta)\right)\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}\right.$$
$$\left.-\frac{\int_0^\infty \left(\bar{l}_{\overrightarrow{WP_c}(\theta)}+\bar{v}_{\overrightarrow{WP_c}}(\theta)\right)\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}} - \frac{\int_0^\infty \left(l_{P_u}(\theta)+\tilde{v}_{P_u}(\theta)\right)\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}\right] = 0 \tag{A.8}$$

Subtracting the second from the first equation gives

$$-\eta_{w,\omega}\frac{\alpha_m}{(1-\alpha_l)\alpha_k}\frac{L}{L_C+L_{P_u}} - \frac{\lambda}{1+\lambda\tilde{\omega}}\left[\frac{L_C}{L_C+L_{P_u}} - \frac{K_C}{K_C+K_{P_u}}\right]$$
$$-\frac{\alpha_m}{(1-\alpha_l)\alpha_k}\int_0^\infty\left[(1-\alpha_l)\frac{l_C(\theta)+\bar{v}_{\overrightarrow{CW}}(\theta)}{L_C+L_{P_u}} - \alpha_k\frac{k_C(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta$$
$$-\frac{\alpha_m}{(1-\alpha_l)\alpha_k}\int_0^\infty\left[(1-\alpha_l)\frac{l_C(\theta)-l_{P_c}(\underline{a}(\theta),\theta)}{L_C+L_{P_u}} - \alpha_k\frac{(k_C(\theta)-\frac{\underline{a}(\theta)}{\lambda})}{K_C+K_{P_u}}\right]\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta$$
$$+\frac{\alpha_m}{(1-\alpha_l)\alpha_k}\int_0^\infty\left[(1-\alpha_l)\frac{\bar{l}_{\overrightarrow{WP_c}(\theta)}+\bar{v}_{\overrightarrow{WP_c}}(\theta)}{L_C+L_{P_u}} - \alpha_k\frac{\bar{k}_{\overrightarrow{WP_c}}(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta$$
$$+\frac{\alpha_m}{(1-\alpha_l)\alpha_k}\int_0^\infty\left[(1-\alpha_l)\frac{l_{P_u}(\theta)+\tilde{v}_{P_u}(\theta)}{L_C+L_{P_u}} - \alpha_k\frac{K_{P_u}(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta = 0.$$

Next note that

$$\frac{L_C}{L_C+L_{P_u}} = \frac{wL_C}{wL_C+wL_{P_u}} = \frac{\alpha_l Y_C}{\alpha_l Y_C + \alpha_l Y_{P_u}} = \frac{Y_C}{Y_C+Y_{P_u}}$$

and

$$\frac{K_C}{K_C+K_{P_u}}=\frac{rK_C}{rK_C+rK_{P_u}}=\frac{\frac{\alpha_k}{1+\lambda\tilde{\omega}}Y_C}{\frac{\alpha_k}{1+\lambda\tilde{\omega}}Y_C+\alpha_k Y_{P_u}}=\frac{Y_C}{Y_C+(1+\lambda\tilde{\omega})Y_{P_u}}$$
$$=\frac{Y_C}{Y_C+Y_{P_u}}\frac{1}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}$$

Using this result and rearranging terms gives

$$\begin{aligned}\eta_{w,\omega}=&-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y} \qquad (A.9)\\ &+\frac{Y_C+Y_{P_u}}{Y}\Bigg\{-\int_0^\infty\left[(1-\alpha_l)\frac{l_C(\theta)+\tilde{v}_{\overrightarrow{CW}}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{k_C(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta\\ &\qquad-\int_0^\infty\left[(1-\alpha_l)\frac{l_C(\theta)-l_{P_c}(\underline{a}(\theta),\theta)}{L_C+L_{P_u}}-\alpha_k\frac{(k_C(\theta)-\frac{\underline{a}(\theta)}{\lambda})}{K_C+K_{P_u}}\right]\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta\\ &\qquad+\int_0^\infty\left[(1-\alpha_l)\frac{\bar{l}_{\overrightarrow{WP_c}}(\theta)+\tilde{v}_{\overrightarrow{WP_c}}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{\bar{k}_{\overrightarrow{WP_c}}(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta\\ &\qquad+\int_0^\infty\left[(1-\alpha_l)\frac{l_{P_u}(\theta)+\tilde{v}_{P_u}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{K_{P_u}(\theta)}{K_C+K_{P_u}}\right]\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta\Bigg\},\end{aligned}$$

which is equivalent to the expression of $\eta_{w,\omega}$ in the main text.

To obtain a more explicit representation, observe that

$$\frac{l_C(\theta)-l_{P_c}(\underline{a},\theta)}{L_C+L_{P_u}}=\frac{y_C(\theta)-y_{P_c}(\underline{a}(\theta),\theta)}{Y_C+Y_{P_u}}$$

and

$$\frac{k_C(\theta)-\frac{\underline{a}(\theta)}{\lambda}}{K_C+K_{P_u}}=\frac{y_C(\theta)-\frac{r(1+\lambda\tilde{\omega})}{F_{k,P_c}(\underline{a}(\theta),\theta)}y_{P_c}(\underline{a}(\theta),\theta)}{Y_C+(1+\lambda\tilde{\omega})Y_{P_u}}$$

Furthermore, the indifference condition for organizational form can be written as

$$\begin{aligned}\alpha_m y_C(\theta)+\mu r\underline{a}(\theta)-\kappa=&y_{P_c}(\underline{a}(\theta),\theta)-wl_{P_c}(\underline{a}(\theta),\theta)-r\frac{\underline{a}(\theta)}{\lambda}\\ =&(1-\alpha_l)y_{P_c}(\underline{a}(\theta),\theta)-r\frac{\underline{a}(\theta)}{\lambda}\end{aligned}$$

which is equivalent to

$$y_{P_c}(\underline{a}(\theta),\theta)=\frac{1}{1-\alpha_l}\left[\alpha_m y_C(\theta)+\mu r\underline{a}(\theta)-\kappa+r\frac{\underline{a}(\theta)}{\lambda}\right]$$

Thus the term in squared brackets in the third line of equation (A.9) can be written as

$$
\begin{aligned}
&\left[(1-\alpha_l)\frac{l_C(\theta)-l_{P_c}(\underline{a}(\theta),\theta)}{L_C+L_{P_u}}-\alpha_k\frac{k_C(\theta)-\frac{\underline{a}}{\lambda}}{K_C+K_{P_u}}\right]\\
&\quad=\frac{\alpha_k y_C(\theta)-\mu r\underline{a}(\theta)+\kappa-r\frac{\underline{a}(\theta)}{\lambda}}{Y_C+Y_{P_u}}-\frac{\alpha_k y_C(\theta)-(1+\lambda\tilde{\omega})r\frac{\underline{a}(\theta)}{\lambda}}{Y_C+(1+\lambda\tilde{\omega})Y_{P_u}}\\
&\quad=\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\alpha_k y_C(\theta)}{Y_C+Y_{P_u}}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\underline{a}(\theta)}{\lambda}}{Y_C+Y_{P_u}}-\frac{\mu r\underline{a}(\theta)-\kappa}{Y_C+Y_{P_u}}.
\end{aligned}
$$

Furthermore, from the indifference condition between working and running a C corporation one obtains

$$w\bar{v}_{\overrightarrow{CW}}(\theta)=\alpha_m y_C(\theta)+\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa$$

and therefore

$$
\begin{aligned}
&(1-\alpha_l)\frac{l_C(\theta)+\bar{v}_{\overrightarrow{CW}}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{k_C(\theta)}{K_C+K_{P_u}}\\
&=(1-\alpha_l)\frac{wl_C(\theta)+w\bar{v}_{\overrightarrow{CW}}(\theta)}{wL_C+wL_{P_u}}-\alpha_k\frac{rk_C}{rK_C+rK_{P_u}}\\
&=(1-\alpha_l)\frac{\left(1+\frac{\alpha_m}{\alpha_l}\right)y_C(\theta)+\frac{\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa}{\alpha_l}}{Y_C+Y_{P_u}}-\alpha_k\frac{y_C(\theta)}{Y_c+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u}}\\
&=\frac{1-\alpha_l}{\alpha_l}\frac{(1-\alpha_k)y_C(\theta)+\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa}{Y_C+Y_{P_u}}-\alpha_k\frac{y_C(\theta)}{Y_c+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u}}\\
&=\frac{y_C(\theta)\Big(\alpha_m(Y_C+Y_{P_u})+(1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}Y_{P_u}\Big)+\big(\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa\big)(Y_C+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u})}{\alpha_l(Y_C+Y_{P_u})(Y_C+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u})}\\
&=\frac{1}{\alpha_l}\frac{\alpha_m+(1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{y_C(\theta)}{Y_C+Y_{P_u}}+\frac{1}{\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa}{Y_C+Y_{P_u}}.
\end{aligned}
$$

Similarly, from the indifference condition between working and running an unconstrained pass-through one obtains

$$w\tilde{v}_{WP_u}(\theta)=\alpha_m y_{P_u}(\theta)$$

and therefore

$$
\begin{aligned}
&(1-\alpha_l)\frac{l_{P_u}(\theta)+\tilde{v}_{WP_u}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{k_{P_u}(\theta)}{K_C+K_{P_u}}\\
&\qquad=(1-\alpha_l)\frac{(1-\alpha_k)y_{P_u}(\theta)}{\alpha_l(Y_C+Y_{P_u})}-\alpha_k\frac{(1+\lambda\tilde{\omega})y_{P_u}(\theta)}{Y_C+(1+\lambda\tilde{\omega})Y_{P_u}}
\end{aligned}
$$

$$=\frac{\alpha_m(Y_C+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u})-\alpha_k\alpha_l\lambda\tilde{\omega}Y_C}{\alpha_l(Y_C+Y_{P_u})(Y_C+Y_{P_u}+\lambda\tilde{\omega}Y_{P_u})}y_{P_u}(\theta)$$
$$=\left(\frac{\alpha_m}{\alpha_l}-\alpha_k\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{y_{P_u}(\theta)}{Y_C+Y_{P_u}}.$$

Finally, from the indifference condition between working and running an unconstrained pass-through one obtains

$$w\bar{v}_{WP_c}(\theta)=(1-\alpha_l)\bar{y}_{\overrightarrow{WP_c}}(\theta)-r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}$$

and therefore

$$(1-\alpha_l)\frac{\bar{l}_{\overrightarrow{WP_c}}(\theta)+\bar{v}_{\overrightarrow{WP_c}}(\theta)}{L_C+L_{P_u}}-\alpha_k\frac{\bar{k}_{\overrightarrow{WP_c}}(\theta)}{K_C+K_{P_u}}$$
$$=(1-\alpha_l)\frac{w\bar{l}_{\overrightarrow{WP_c}}(\theta)+w\bar{v}_{\overrightarrow{WP_c}}(\theta)}{wL_C+wL_{P_u}}-\alpha_k\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}}{rK_C+rK_{P_u}}$$
$$=(1-\alpha_l)\frac{\bar{y}_{\overrightarrow{WP_c}}(\theta)-r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}}{\alpha_l(Y_C+Y_{P_u})}-\frac{(1+\lambda\tilde{\omega})r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}}{Y_C+(1+\lambda\tilde{\omega})Y_{P_u}}$$
$$=\frac{1-\alpha_l}{\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}(\theta)}{Y_C+Y_{P_u}}-\left(\frac{1-\alpha_l}{\alpha_l}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}}{Y_C+Y_{P_u}}.$$

Plugging all these results into equation (A.9) gives

$$\eta_{w,\omega}=-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y} \tag{A.10}$$
$$-\int_0^\infty\left[\frac{1}{\alpha_l}\frac{\alpha_m+(1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{y_C(\theta)}{Y}+\frac{1}{\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}}(\theta)-\kappa}{Y}\right]\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta$$
$$-\int_0^\infty\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\alpha_k y_C(\theta)}{Y}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\underline{a}(\theta)}{\lambda}}{Y}-\frac{\mu r\underline{a}(\theta)-\kappa}{Y}\right]\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta$$
$$+\int_0^\infty\left[\frac{1-\alpha_l}{\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}(\theta)}{Y}-\left(\frac{1-\alpha_l}{\alpha_l}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}(\theta)}{\lambda}}{Y}\right]\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta$$
$$+\int_0^\infty\left[\left(\frac{\alpha_m}{\alpha_l}-\alpha_k\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{y_{P_u}(\theta)}{Y}\right]\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta.$$

This is the same as

$$\eta_{w,\omega} = -\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y}$$
$$-\left[\frac{1}{\alpha_l}\frac{\alpha_m+(1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\bar{y}_{\overrightarrow{CW}}}{Y}+\frac{1}{\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}}-\kappa}{Y}\right]\overrightarrow{CW}$$
$$-\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\alpha_k\bar{y}_{C,\overrightarrow{CP_c}}}{Y}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}}{Y}-\frac{\mu r\bar{a}_{\overrightarrow{CP_c}}-\kappa}{Y}\right]\overrightarrow{CP_c}$$
$$+\left[\frac{1-\alpha_l}{\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}}{Y}-\left(\frac{1-\alpha_l}{\alpha_l}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y}\right]\overrightarrow{WP_c}$$
$$+\left(\frac{\alpha_m}{\alpha_l}-\alpha_k\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y}\overrightarrow{WP_u}. \tag{A.11}$$

To obtain a similar expression for $\eta_{r,\omega}$ note that rearranging equation (A.8) gives

$$\eta_{r,\omega} = -\eta_{w,\omega}\frac{\alpha_k\alpha_l+\alpha_m\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l)\alpha_k}-\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{L_C}{L_C+L_{P_u}}$$
$$-\frac{\alpha_m}{\alpha_k}\left[\frac{\int_0^\infty\left(l_C(\theta)+\bar{v}_{\overrightarrow{CW}}(\theta)\right)\overrightarrow{CW}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}+\frac{\int_0^\infty\left(l_C(\theta)-l_{P_c}(\theta)\right)\overrightarrow{CP_c}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}\right.$$
$$\left.-\frac{\int_0^\infty\left(\bar{l}_{\overrightarrow{WP_c}(\theta)}+\bar{v}_{\overrightarrow{WP_c}}(\theta)\right)\overrightarrow{WP_c}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}-\frac{\int_0^\infty\left(l_{P_u}(\theta)+\tilde{v}_{P_u}(\theta)\right)\overrightarrow{WP_u}(\theta)\gamma_\theta(\theta)d\theta}{L_C+L_{P_u}}\right].$$

Plugging in $\eta_{w,\omega}$ from equation (A.9) and rearranging terms gives the expression for $\eta_{r,\omega}$ in the main text.

To obtain a more explicit representation, one can use analogous arguments as above, which gives

$$\eta_{r,\omega} = -\eta_{w,\omega}\frac{\alpha_k\alpha_l+\alpha_m\frac{Y}{Y_C+Y_{P_u}}}{(1-\alpha_l)\alpha_k}-\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y_C+Y_{P_u}}$$
$$-\left(\frac{(1-\alpha_k)\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{CW}}}{Y_C+Y_{P_u}}+\frac{\alpha_m}{\alpha_k\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}}-\kappa}{Y_C+Y_{P_u}}\right)\overrightarrow{CW}-\frac{\alpha_m}{\alpha_k(1-\alpha_l)}\frac{\alpha_k\bar{y}_{C,\overrightarrow{CP_c}}-r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}-\mu r\bar{a}_{\overrightarrow{CP_c}}+\kappa}{Y_C+Y_{P_u}}\overrightarrow{CP_c}$$
$$+\frac{\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}-r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y_C+Y_{P_u}}\overrightarrow{WP_c}+\frac{(1-\alpha_k)\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y_C+Y_{P_u}}\overrightarrow{WP_u}.$$

Plugging in (A.11) for $\eta_{w,\omega}$ gives

$$
\begin{aligned}
\eta_{r,\omega} = & -\frac{1-\frac{\alpha_k\alpha_l}{\alpha_m}\lambda\tilde{\omega}\frac{Y_{P_u}}{Y}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y_C+Y_{P_u}} \\
& + \frac{1-\alpha_k+\frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{\alpha_k\alpha_l}\left[\frac{\alpha_m+(1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\bar{y}_{\overrightarrow{CW}}}{Y}+\frac{\mu r\bar{a}_{\overrightarrow{CW}}-\kappa}{Y}\right]\overrightarrow{CW} \\
& - \left(\frac{(1-\alpha_k)\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{CW}}}{Y_C+Y_{P_u}}+\frac{\alpha_m}{\alpha_k\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}}-\kappa}{Y_C+Y_{P_u}}\right)\overrightarrow{CW} \\
& + \frac{1-\alpha_k+\frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{\alpha_k}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\alpha_k\bar{y}_{C,\overrightarrow{CP_c}}}{Y}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}}{Y}-\frac{\mu r\bar{a}_{\overrightarrow{CP_c}}-\kappa}{Y}\right]\overrightarrow{CP_c} \\
& - \frac{\alpha_m}{\alpha_k(1-\alpha_l)}\frac{\alpha_k\bar{y}_{C,\overrightarrow{CP_c}}-r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}-\mu r\bar{a}_{\overrightarrow{CP_c}}-\kappa}{Y_C+Y_{P_u}}\overrightarrow{CP_c} \\
& - \frac{1-\alpha_k+\frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{\alpha_k}\left[\frac{1-\alpha_l}{\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}}{Y}-\left(\frac{1-\alpha_l}{\alpha_l}+\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y}\right]\overrightarrow{WP_c} \\
& + \frac{\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_c}}-r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y_C+Y_{P_u}}\overrightarrow{WP_c} \\
& - \frac{1-\alpha_k+\frac{\alpha_m}{1-\alpha_l}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{\alpha_k}\left(\frac{\alpha_m}{\alpha_l}-\alpha_k\frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y}\overrightarrow{WP_u}+\frac{(1-\alpha_k)\alpha_m}{\alpha_k\alpha_l}\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y_C+Y_{P_u}}\overrightarrow{WP_u}.
\end{aligned}
$$

Collecting terms gives

$$
\begin{aligned}
\eta_{r,\omega} = & -\frac{1-\frac{\alpha_k\alpha_l}{\alpha_m}\lambda\tilde{\omega}\frac{Y_{P_u}}{Y}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y_C+Y_{P_u}} \\
& + \left[\frac{(1-\alpha_k)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}+\frac{\alpha_m^2}{\alpha_k\alpha_l(1-\alpha_l)}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\bar{y}_{\overrightarrow{CW}}}{Y}+\left(\frac{1-\alpha_l}{\alpha_k\alpha_l}+\frac{\alpha_m\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{\alpha_k(1-\alpha_l)}\right)\frac{\mu r\bar{a}_{\overrightarrow{CW}}-\kappa}{Y}\right]\overrightarrow{CW} \\
& + \left[\frac{\frac{\alpha_k\alpha_l}{1-\alpha_l}\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}-\frac{\alpha_m}{1-\alpha_l}\frac{Y}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\bar{y}_{C,\overrightarrow{CP_c}}}{Y}+\frac{\frac{\alpha_m}{\alpha_k(1-\alpha_l)}\left(1+\lambda\tilde{\omega}\left(1+2\frac{Y_{P_c}}{Y_C+Y_{P_u}}\right)\right)+\frac{\alpha_l}{1-\alpha_l}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}}{Y}\right. \\
& \qquad \left. -\frac{\alpha_l}{1-\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CP_c}}-\kappa}{Y}\right]\overrightarrow{CP_c} \\
& + \left[\frac{\bar{y}_{\overrightarrow{WP_c}}}{Y}+\left(1+\frac{\frac{1-\alpha_k}{\alpha_k}+\frac{\alpha_m}{\alpha_k(1-\alpha_l)}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y}\right]\overrightarrow{WP_c}
\end{aligned}
$$

$$+\left(\alpha_m \frac{Y_{P_c}}{Y_C + Y_{P_u}} + \frac{\left(1-\alpha_k + \frac{\alpha_m}{1-\alpha_l}\frac{Y_C}{Y_C+Y_{P_u}}\right)\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y}\overrightarrow{WP_u}.$$

Signs. Regarding the signs of the effects it is trivial to see that

$$\beta^r_{\overrightarrow{WP_c}} = \left[\frac{\bar{y}_{\overrightarrow{WP_c}}}{Y} + \left(1 + \frac{\frac{1-\alpha_k}{\alpha_k} + \frac{\alpha_m}{\alpha_k(1-\alpha_l)}\frac{Y_{P_c}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{r\frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}}{Y}\right] > 0,$$

and

$$\beta^r_{\overrightarrow{WP_u}} = \left(\alpha_m \frac{Y_{P_c}}{Y_C + Y_{P_u}} + \frac{\left(1-\alpha_k + \frac{\alpha_m}{1-\alpha_l}\frac{Y_C}{Y_C+Y_{P_u}}\right)\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\right)\frac{\bar{y}_{\overrightarrow{WP_u}}}{Y}\Bigg] > 0.$$

Consider next the sign of coefficient $\beta^w_{\overrightarrow{CP_c}}$,

$$\begin{aligned} sign(\beta^w_{\overrightarrow{CP_c}}) &= -\,sign\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\alpha_k\bar{y}_{C,\overrightarrow{CP_c}}}{Y} + \frac{\lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}}{Y} - \frac{\mu r\bar{a}_{\overrightarrow{CP_c}} - \kappa}{Y}\right] \\ &= -\,sign\left[\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\alpha_k\bar{y}_{C,\overrightarrow{CP_c}} + \lambda\tilde{\omega}\frac{Y_C}{Y_C+Y_{P_u}}r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda} - \left(1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)\left(\mu r\bar{a}_{\overrightarrow{CP_c}} - \kappa\right)\right]. \end{aligned}$$

From the indifference condition of agents at the margin between operating a C corporation vs. a pass-through we know that

$$\alpha_m\bar{y}_{C,\overrightarrow{CP_c}} + \mu r\bar{a}_{\overrightarrow{CP_c}} - \kappa = (\alpha_k + \alpha_m)\bar{y}_{P_c,\overrightarrow{CP_c}} - r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda},$$

which implies that

$$\mu r\bar{a}_{\overrightarrow{CP_c}} - \kappa = \alpha_k\bar{y}_{P_c,\overrightarrow{CP_c}} - \alpha_m(\bar{y}_{C,\overrightarrow{CP_c}} - \bar{y}_{P_c,\overrightarrow{CP_c}}) - r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}. \tag{A.12}$$

Plugging this into the equation above gives

$$sign(\beta^w_{\overrightarrow{CP_c}}) = -\,sign\left[\left(\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}(\alpha_k+\alpha_m) + \alpha_m\right)\left(\bar{y}_{C,\overrightarrow{CP_c}} - \bar{y}_{P_c,\overrightarrow{CP_c}}\right) - \alpha_k\bar{y}_{P_c,\overrightarrow{CP_c}} + r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}(1+\lambda\tilde{\omega})\right].$$

Since $\bar{y}_{C,\overrightarrow{CP_c}} > \bar{y}_{P_c,\overrightarrow{CP_c}}$ the expression in squared brackets must be larger than

$$\left[\alpha_m(\bar{y}_{C,\overrightarrow{CP_c}} - \bar{y}_{P_c,\overrightarrow{CP_c}}) - \alpha_k\bar{y}_{P_c,\overrightarrow{CP_c}} + r\frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}(1+\lambda\tilde{\omega})\right] = \omega r\bar{a}_{\overrightarrow{CP_c}} + \kappa > 0$$

where the equality follows from (A.12) and we used that $\tilde{\omega} = \mu + \omega$. Consequently $\beta^w_{\overrightarrow{CP_c}} < 0$.

Finally, consider the sign of coefficient $\beta^{w}_{\overrightarrow{CW}}$,

$$\begin{aligned} sign(\beta^{w}_{\overrightarrow{CW}}) &= -\,sign\left[\frac{1}{\alpha_l}\frac{\alpha_m + (1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\bar{y}_{\overrightarrow{CW}}}{Y} + \frac{1}{\alpha_l}\frac{\mu r\bar{a}_{\overrightarrow{CW}} - \kappa}{Y}\right] \\ &= -\,sign\left[\left(\alpha_m + (1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)\bar{y}_{\overrightarrow{CW}} + \left(1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)(\mu r\bar{a}_{\overrightarrow{CW}} - \kappa)\right] \end{aligned}$$

The indifference condition between working and running a C corporation implies that

$$w\bar{v}_{\overrightarrow{CW}} = \alpha_m \bar{y}_{C,\overrightarrow{CW}} + \mu r\bar{a}_{\overrightarrow{CW}} - \kappa,$$

which is equivalent to

$$\mu r\bar{a}_{\overrightarrow{CW}} - \kappa = w\bar{v}_{\overrightarrow{CW}} - \alpha_m\bar{y}_{\overrightarrow{CW}}. \tag{A.13}$$

Plugging this into the equation above gives

$$\begin{aligned} sign(\beta^{w}_{\overrightarrow{CW}}) &= -\,sign\Bigg[\left(\alpha_m + (1-\alpha_k)(1-\alpha_l)\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)\bar{y}_{\overrightarrow{CW}} \\ &\qquad + \left(1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)(w\bar{v}_{\overrightarrow{CW}} - \alpha_m\bar{y}_{\overrightarrow{CW}})\Bigg] \\ &= -\,sign\left[\alpha_k\alpha_l\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\bar{y}_{\overrightarrow{CW}} + \left(1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}\right)w\bar{v}_{\overrightarrow{CW}}\right] < 0. \end{aligned}$$

This completes the proof. □

A.3 Proof of Proposition 2

Proof. Consider first entrepreneurs, who run an unconstrained pass-through. Their total output is given by

$$Y_{P_u} = F(K_{P_u}, L_{P_u}, M_{P_u})$$

and therefore

$$\frac{dY_{P_u}}{d\omega} = \frac{dK_{P_u}}{d\omega}r + \frac{dL_{P_u}}{d\omega}w + \frac{dM_{P_u}}{d\omega}w^m_{P_u},$$

where $w^{P_u}_m$ is the compensation for the manager per efficiency unit of managerial input. This can be written in terms of semi-elasticities,

$$\eta_{Y_{P_u},\omega} = \eta_{K_{P_u},\omega}\frac{rK_{P_u}}{Y_{P_u}} + \eta_{L_{P_u},\omega}\frac{wL_{P_u}}{Y_{P_u}} + \eta_{M_{P_u},\omega}\frac{w^m_{P_u}M_{P_u}}{Y_{P_u}}$$

$$=\alpha_k \eta_{K_{P_u},\omega} + \alpha_l \eta_{L_{P_u},\omega} + \alpha_m \eta_{M_{P_u},\omega}.$$

Furthermore, from Euler's theorem we know that

$$Y_{P_u} = rK_{P_u} + wL_{P_u} + w^m_{P_u} M_{P_u}$$

and therefore

$$\frac{dY_{P_u}}{d\omega} = \frac{dr}{d\omega} K_{P_u} + r\frac{dK_{P_u}}{d\omega} + \frac{dw}{d\omega} L_{P_u} + w\frac{dL_{P_u}}{d\omega} + \frac{dw^m_{P_u}}{d\omega} M_{P_u} + w^m_{P_u}\frac{dM_{P_u}}{d\omega},$$

which also can be written in terms of semi-elasticities,

$$\begin{aligned}\eta_{Y_{P_u},\omega} =&(\eta_{r,\omega} + \eta_{K_{P_u},\omega})\frac{rK_{P_u}}{Y_{P_u}} + (\eta_{w,\omega} + \eta_{L_{P_u},\omega})\frac{wL_{P_u}}{Y_{P_u}} + (\eta_{w^m_{P_u},\omega} + \eta_{M_{P_u},\omega})\frac{w^m_{P_u} M_{P_u}}{Y_{P_u}} \\ =&\alpha_k(\eta_{r,\omega} + \eta_{K_{P_u},\omega}) + \alpha_l(\eta_{w,\omega} + \eta_{L_{P_u},\omega}) + \alpha_m(\eta_{w^m_{P_u},\omega} + \eta_{M_{P_u},\omega}).\end{aligned}$$

Combining the two equations gives

$$\alpha_k \eta_{r,\omega} + \alpha_l \eta_{w,\omega} + \alpha_m \eta_{w^m_{P_u},\omega} = 0.$$

Therefore, the semi-elasticity of the managerial wage in unconstrained pass-throughs with respect to the tax wedge is given by

$$\eta_{w^m_{P_u},\omega} = -\frac{1}{\alpha_m}\left[\alpha_k \eta_{r,\omega} + \alpha_l \eta_{w,\omega}\right]$$

C corporations. Next, consider the entrepreneurs who run a C corporation. Output produced in these firms is given by

$$Y_C = F(K_C, L_C, M_C)$$

and therefore

$$\frac{dY_C}{d\omega} = \frac{dK_C}{d\omega} r(1+\lambda\tilde{\omega}) + \frac{dL_C}{d\omega} w + \frac{dM_C}{d\omega}\hat{w}^m_C,$$

where $\hat{w}^C_m$ is the compensation for the manager per efficiency unit of managerial input gross of the costs from equity issuances and incorporation. This can be written in terms of semi-elasticities,

$$\begin{aligned}\eta_{Y_C,\omega} =&\eta_{K_C,\omega}\frac{r(1+\lambda\tilde{\omega})K_C}{Y_C} + \eta_{L_C,\omega}\frac{wL_C}{Y_C} + \eta_{M_C,\omega}\frac{\hat{w}^m_C M_C}{Y_C} \\ =&\alpha_k \eta_{K_C,\omega} + \alpha_l \eta_{L_C,\omega} + \alpha_m \eta_{M_C,\omega}.\end{aligned}$$

Furthermore, from Euler's theorem we know that

$$Y_C = r(1+\lambda\tilde{\omega})K_C + wL_C + \hat{w}_C^m M_C$$

and therefore

$$\frac{dY_C}{d\omega} = r\lambda K_C + \frac{dr}{d\omega}(1+\lambda\tilde{\omega})K_C + r(1+\lambda\tilde{\omega})\frac{dK_C}{d\omega} + \frac{dw}{d\omega}L_C + w\frac{dL_C}{d\omega} + \frac{d\hat{w}_C^m}{d\omega}M_C + \hat{w}_C^m\frac{dM_C}{d\omega},$$

which also can be written in terms of semi-elasticities,

$$\begin{aligned}\eta_{Y_C,\omega} =& \left(\frac{\lambda}{1+\lambda\tilde{\omega}} + \eta_{r,\omega} + \eta_{K_C,\omega}\right)\frac{r(1+\lambda\tilde{\omega})K_C}{Y_C} + (\eta_{w,\omega} + \eta_{L_C,\omega})\frac{wL_C}{Y_C} \\ &+ (\eta_{\hat{w}_C^m,\omega} + \eta_{M_C,\omega})\frac{\hat{w}_C^m M_C}{Y_C} \\ =&\alpha_k\left(\frac{\lambda}{1+\lambda\tilde{\omega}} + \eta_{r,\omega} + \eta_{K_C,\omega}\right) + \alpha_l(\eta_{w,\omega} + \eta_{L_C,\omega}) + \alpha_m(\eta_{\hat{w}_C^m,\omega} + \eta_{M_C,\omega}).\end{aligned}$$

Combining the two equations gives

$$\alpha_k\left(\frac{\lambda}{1+\lambda\tilde{\omega}} + \eta_{r,\omega}\right) + \alpha_l\eta_{w,\omega} + \alpha_m\eta_{\hat{w}_C^m,\omega} = 0.$$

Therefore, the semi-elasticity of the managerial wage in C corporations, gross of costs, with respect to the tax wedge is given by

$$\eta_{\hat{w}_C^m,\omega} = -\frac{1}{\alpha_m}\left[\alpha_k\left(\frac{\lambda}{1+\lambda\tilde{\omega}} + \eta_{r,\omega}\right) + \alpha_l\eta_{w,\omega}\right] = \eta_{w_{P_u}^m} - \frac{\alpha_k}{\alpha_m}\frac{\lambda}{1+\lambda\tilde{\omega}}.$$

Now, the C corporation entrepreneur faces additional costs from equity issuance and incorporation. Specifically, the actual wage income of a C entrepreneur with assets a and ability θ is given by

$$\theta w_C^m(a,\theta) = \theta\hat{w}_C^m - \kappa + \mu ra.$$

Deriving with respect to ω gives

$$\theta\frac{dw_C^m(a,\theta)}{d\omega} = \theta\frac{d\hat{w}_C^m}{d\omega} + \mu a\frac{dr}{d\omega},$$

which in terms of semi-elasticities is the same as

$$\theta\eta_{w_C^m(a,\theta),\omega} = \theta\eta_{\hat{w}_C^m(a,\theta),\omega}\frac{\hat{w}_C^m}{w_C^m(a,\theta)} + \eta_{r,\omega}\frac{\mu ra}{w_C^m(a,\theta)},$$

which is equivalent to

$$\eta_{w_C^m(a,\theta),\omega} = \eta_{\hat{w}_C^m(a,\theta),\omega} \frac{\theta \hat{w}_C^m}{\theta w_C^m(a,\theta)} + \eta_{r,\omega} \frac{\mu r a}{\theta w_C^m(a,\theta)}.$$

Constrained Pass-Throughs. The output of a constrained pass-through business, whose owner has ability θ and wealth a is given by

$$y_{P_c}(a,\theta) = F\Big(\frac{a}{\lambda}, l_{P_c}(a,\theta), \theta\Big).$$

Hence,

$$\frac{dy_{P_c}(a,\theta)}{d\omega} = F_k\Big(\frac{a}{\lambda}, l_{P_c}(a,\theta), \theta\Big) \underbrace{\frac{da}{d\omega}}_{=0} \frac{1}{\lambda} + w\frac{dl_{P_c}(a,\theta)}{d\omega} + F_m\Big(\frac{a}{\lambda}, l_{P_c}(a,\theta), \theta\Big) \underbrace{\frac{d\theta}{d\omega}}_{=0}.$$

In terms of semi-elasticities,

$$\eta_{y_{P_c}(a,\theta),\omega} = \frac{w l_{P_c(a,\theta)}}{y_{P_c}(a,\theta)} \eta_{l_{P_c}(a,\theta),\omega} = \alpha_l \eta_{l_{P_c}(a,\theta),\omega}.$$

The effective wage of the entrepreneur is implicitly given by

$$w_{P_c}^m(a,\theta)\theta = y_{P_c}(a,\theta) - w l_{P_c}(a,\theta) - r\frac{a}{\lambda}.$$

Deriving with respect to ω gives

$$\frac{dw_{P_c}^m(a,\theta)}{d\omega}\theta = \frac{dy_{P_c}(a,\theta)}{d\omega} - \frac{dw}{d\omega} l_{P_c}(a,\theta) - w\frac{dl_{P_c}(a,\theta)}{d\omega} - \frac{dr}{d\omega}\frac{a}{\lambda},$$

which in terms of semi-elasticities is

$$\eta_{w_{P_c}^m(a,\theta),\omega} \frac{w_{P_c}(a,\theta)\theta}{y_{P_c}(a,\theta)} = \eta_{y_{P_c}(a,\theta),\omega} - \alpha_l(\eta_{w,\omega} + \eta_{l_{P_c}(a,\theta),\omega}) - \eta_{r,\omega} \frac{r\frac{a}{\lambda}}{y_{P_c}(a,\theta)}.$$

Using the results above this is equivalent to

$$\eta_{w_{P_c}^m(a,\theta),\omega}\left(1 - \alpha_l - \frac{r\frac{a}{\lambda}}{y_{P_c}(a,\theta)}\right) = -\alpha_l \eta_{w,\omega} - \eta_{r,\omega}\frac{r\frac{a}{\lambda}}{y_{P_c}(a,\theta)}.$$

Hence, we get

$$\eta_{w_{P_c}^m(a,\theta),\omega} = -\frac{\alpha_l \eta_{w,\omega} + \eta_{r,\omega}\frac{r\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}{1 - \alpha_l - \frac{r\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}$$

$$= -\frac{\alpha_l \eta_{w,\omega} + \eta_{r,\omega}\left(\alpha_k - \frac{(F_{k,P_c}(a,\theta)-r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}\right)}{\alpha_m + \frac{(F_{k,P_c}(a,\theta)-r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}$$

$$= \frac{\alpha_m \eta_{w^m_{P_u},\omega} + \eta_{r,\omega}\frac{(F_{k,P_c}(a,\theta)-r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}{\alpha_m + \frac{(F_{k,P_c}(a,\theta)-r)\frac{a}{\lambda}}{y_{P_c}(a,\theta)}}.$$

□

A.4 Proof of Proposition 3 and Decompositions of Section B.2

Proof. In this section we proof Proposition 3. However, we derive more explicit formulations for output and gross income changes that are in line with those in Appendix B.2.

Output produced in unconstrained pass-throughs is

$$Y_{P_u} = F(K_{P_u}, L_{P_u}, M_{P_u}),$$

output produced in C corporations is

$$Y_C = F(K_C, L_C, M_C)$$

and output in constrained pass-throughs is given by

$$Y_{P_c} = \int_0^\infty \int_{\underline{a}(\theta)}^{k_{P_u}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{\nu}(a,\theta)|a,\theta) F\left(\frac{a}{\lambda}, l_{P_c}(a,\theta), \theta\right) \gamma_{a|\theta}(a|\theta)\gamma_\theta(\theta) d\theta.$$

Note that infra-marginal constrained pass-throughs can only adjust labor demand but not capital demand.

The derivative of output with respect to the tax wedge is

$$\frac{dY}{d\omega} = \frac{dY_C}{d\omega} + \frac{dY_{P_c}}{d\omega} + \frac{dY_{P_u}}{d\omega},$$

where

$$\frac{dY_{P_u}}{d\omega} = F_{k,P_u}\frac{dK_{P_u}}{d\omega} + F_l \frac{dL_{P_u}}{d\omega} + F_{m,P_u}\frac{dM_{P_u}}{d\omega}$$

$$\frac{dY_C}{d\omega} = F_{k,C}\frac{dK_C}{d\omega} + F_l \frac{dL_C}{d\omega} + F_{m,C}\frac{dM_C}{d\omega}$$

and

$$\frac{dY_{P_c}}{d\omega} = \bar{y}_{P_c,\overrightarrow{CP_c}}\overrightarrow{CP_c} + \bar{y}_{P_c,\overrightarrow{WP_c}}\overrightarrow{WP_c} + F_l \int_0^\infty \int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{\nu}(a,\theta)|a,\theta)\frac{dl_{P_c}(a,\theta)}{d\omega}\gamma_{a|\theta}(a|\theta)\gamma_\theta(\theta) da d\theta.$$

Note that the marginal product of labor is equalized across all firms.

Now observe that we can decompose the output produced in marginal constrained pass-throughs as follows. Output produced by constrained pass-throughs, whose owner-manager is at the margin to running a C corporation can be written as

$$\bar{y}_{P_c,\overrightarrow{CP_c}}\overrightarrow{CP_c} = F_l \bar{l}_{P_c,\overrightarrow{CP_c}}\overrightarrow{CP_c} + \int_0^\infty \left(F_{k,P_c}(\underline{a}(\theta),\theta)\frac{\underline{a}(\theta)}{\lambda} + F_{m,P_c}(\underline{a}(\theta),\theta)\theta \right) \\ \times \Gamma_{\nu|a,\theta}(\tilde{\nu}(\underline{a}(\theta),\theta)|\underline{a}(\theta),\theta)\gamma_{a|\theta}(\underline{a}(\theta)|\theta)\gamma_\theta(\theta)d\theta,$$

while output produced by constrained pass-throughs, whose owner-manager is at the margin to becoming a worker can be written as

$$\bar{y}_{P_c,\overrightarrow{WP_c}}\overrightarrow{WP_c} = F_l \bar{l}_{P_c,\overrightarrow{WP_c}}\overrightarrow{WP_c} + \int_0^\infty \int_{\underline{a}(\theta)}^{k_{P_u}(\theta)} \left(F_{k,P_c}(a,\theta)\frac{a}{\lambda} + F_{m,P_c}(a,\theta)\theta \right) \\ \times \gamma_{\nu|a,\theta}(\tilde{\nu}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)\gamma_\theta(\theta)d\theta.$$

Furthermore, decomposing the changes in output produced by the three firm types into extensive and intensive margin changes, that is changes in the scale of production of firms that continue to operate under the same legal form, vs. changes due to occupational/organizational switches, gives

$$\begin{aligned}
\frac{dY_{P_u}}{d\omega} =& F_{k,P_u}\left(\eta_{k_{P_u},\omega}K_{P_u} + \bar{k}_{P_u,\overrightarrow{WP_u}}\overrightarrow{WP_u}\right) + F_l\left(\eta_{l_{P_u},\omega}L_{P_u} + \bar{l}_{P_u,\overrightarrow{WP_u}}\overrightarrow{WP_u}\right) + F_{m,P_u}\bar{\theta}_{\overrightarrow{WP_u}}\overrightarrow{WP_u}, \\
\frac{dY_C}{d\omega} =& F_{k,C}\left(\eta_{k_C,\omega}K_C - \bar{k}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c} - \bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right) + F_l\left(\eta_{l_C,\omega}L_C - \bar{l}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c} - \bar{l}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right) \\
& - F_{m,C}\left(\bar{\theta}_{\overrightarrow{CP_c}}\overrightarrow{CP_c} + \bar{\theta}_{\overrightarrow{CW}}\overrightarrow{CW}\right), \\
\frac{dY_{P_c}}{d\omega} =& F_l\left(\bar{l}_{P_c,\overrightarrow{WP_c}}\overrightarrow{WP_c} + \bar{l}_{P_c,\overrightarrow{CP_c}}\overrightarrow{CP_c} + \eta_{l_{P_c}}L_{P_c}\right) \\
& + \int_0^\infty \left(F_{k,P_c}(\underline{a}(\theta),\theta)\frac{\underline{a}(\theta)}{\lambda} + F_{m,P_c}(a,\theta)\theta \right)\Gamma_{\nu|a,\theta}(\tilde{\nu}(\underline{a}(\theta),\theta)|\underline{a}(\theta),\theta)\gamma_{a|\theta}(\underline{a}(\theta)|\theta)\gamma_\theta(\theta)d\theta \\
& + \int_0^\infty \int_{\underline{a}(\theta)}^{k_{P_u}(\theta)} \left(F_{k,P_c}(a,\theta)\frac{a}{\lambda} + F_{m,P_c}(a,\theta)\theta \right)\gamma_{\nu|a,\theta}(\tilde{\nu}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)\gamma_\theta(\theta)d\theta
\end{aligned}$$

The total derivatives of the two factor market clearing conditions are given by[A.1]

$$\eta_{k_C,\omega}K_C - \bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW} - \left(\bar{k}_{C,\overrightarrow{CP_c}} - \frac{\bar{a}_{\overrightarrow{CP_c}}}{\lambda}\right)\overrightarrow{CP_c} + \frac{\bar{a}_{\overrightarrow{WP_c}}}{\lambda}\overrightarrow{WP_c} + \eta_{k_{P_u},\omega}K_{P_u} + \bar{k}_{P_u,\overrightarrow{WP_u}}\overrightarrow{WP_u} = 0 \tag{A.14}$$

and

$$\eta_{l_C,\omega}L_C - \left(\bar{l}_{C,\overrightarrow{CW}} + \bar{\nu}_{\overrightarrow{CW}}\right)\overrightarrow{CW} - \left(\bar{l}_{C,\overrightarrow{CP_c}} - \bar{l}_{P_c,\overrightarrow{CP_c}}\right)\overrightarrow{CP_c} + \eta_{l_{P_c},\omega}L_{P_c}$$

[A.1] Tthis can be shown, for example, by aggregating over θ equations (A.6) and (A.7) in the proof of Proposition 1.

$$+\left(\bar{l}_{P_c,\overrightarrow{WP_c}}+\bar{v}_{\overrightarrow{WP_c}}\right)\overrightarrow{WP_c}+\eta_{l_{P_u},\omega}L_{P_u}+\left(\bar{l}_{P_u,\overrightarrow{WP_u}}+\bar{v}_{\overrightarrow{WP_u}}\right)\overrightarrow{WP_u}=0, \tag{A.15}$$

Summing output over the three firm types and using these market clearing conditions, one can show that the total output change is equivalent to

$$\begin{aligned}
\frac{dY}{d\omega} =& -\overrightarrow{CW}\left(F_{m,C}\bar{\theta}_{\overrightarrow{CW}}-F_l\bar{v}_{\overrightarrow{CW}}\right)-\overrightarrow{WP_u}\left(F_l\bar{v}_{P_u}-F_{m,P_u}\bar{\theta}_{\overrightarrow{WP_u}}\right)\\
&-\Bigg(\overrightarrow{WP_c}F_l\bar{v}_{\overrightarrow{WP_c}}-\int_0^\infty\int_{\underline{a}(\theta)}^{k_{P_u}(\theta)}\left(\left[F_{k,P_c}(a,\theta)-F_{k,P_u}\right]\frac{a}{\lambda}+F_{m,P_c}(a,\theta)\theta\right)\\
&\qquad\qquad\times\gamma_{v|a,\theta}(\tilde{v}(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)\gamma_\theta(\theta)d\theta\Bigg)\\
&-\overrightarrow{CP_c}\Bigg(F_{m,C}\bar{\theta}_{\overrightarrow{CP_c}}-\int_0^\infty\left(\left[F_{k,P_c}(\underline{a}(\theta),\theta)-F_{k,P_u}\right]\frac{\underline{a}(\theta)}{\lambda}+F_{m,P_c}(a,\theta)\theta\right)\\
&\qquad\qquad\times\Gamma_{v|a,\theta}(\tilde{v}(\underline{a}(\theta),\theta)|\underline{a}(\theta),\theta)\gamma_{a|\theta}(\underline{a}(\theta)|\theta)\gamma_\theta(\theta)d\theta\Bigg)\\
&+\left[F_{k,C}-F_{k,P_u}\right]\left(\eta_{k_C,\omega}K_C-\bar{k}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c}-\bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right)
\end{aligned}$$

Now observe that from the indifference conditions of agents at the margin between working and running a C corporation the first term is equal to

$$-\overrightarrow{CW}\left(F_{m,C}\bar{\theta}_{\overrightarrow{CW}}-F_l\bar{v}_{\overrightarrow{CW}}\right)=-\left[\kappa+\mu r\left(\lambda\bar{k}_{C,\overrightarrow{CW}}-\bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW},$$

while the indifference conditions of agents at the margin between working and running (unconstrained and constrained) pass-throughs imply that the second and third terms are both zero.

Similarly, the indifference conditions of agents at the margin between running a C corporation and a constrained pass-through implies that the fourth term is equal to

$$-\left[\kappa+\mu r\left(\lambda\bar{k}_{C,\overrightarrow{CP_c}}-\bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c}.$$

Hence, the output change is given by

$$\begin{aligned}
\frac{dY}{d\omega}=&-\left[\kappa+\mu r\left(\lambda\bar{k}_{C,\overrightarrow{CW}}-\bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW}-\left[\kappa+\mu r\left(\lambda\bar{k}_{C,\overrightarrow{CP_c}}-\bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c}\\
&+\left[F_{k,C}-F_{k,P_u}\right]\underbrace{\left(\eta_{k_C,\omega}K_C-\bar{k}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c}-\bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right)}_{\frac{dK_C}{d\omega}}.
\end{aligned}$$

It is easy to see that all terms in squared brackets are positive. Specifically, agents at the margin to run a C corporation must have less wealth than their total equity, for otherwise they would not consider to run a C corporation. Furthermore, we have shown in the main text already that

$$F_{k,C} - F_{k,P_u} = r\lambda(\omega + \mu) \geq 0.$$

Since $\eta_{k_C,\omega} < 0$, $\overrightarrow{CP_c} \geq 0$ and $\overrightarrow{CW} \geq 0$ this implies that

$$\frac{dY}{d\omega} \leq 0.$$

Observe that

$$cost_{\overrightarrow{CP_c},\overrightarrow{CW}} \equiv \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CP_c}} - \bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c} + \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CW}} - \bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW}$$

are the total incorporation- and equity issuance costs of marginal C corporations, that is C corporations that exit upon a marginal increase in ω. Using this notation we can write the relative output loss as

$$\eta_{Y,\omega} = \frac{r\lambda(\omega+\mu)K_C}{Y}\eta_{K_C,\omega} - \frac{cost_{\overrightarrow{CP_c},\overrightarrow{CW}}}{Y}.$$

Aggregate gross income is given by

$$\tilde{Y} = Y - \mu r E^o - \kappa C.$$

Hence

$$\begin{aligned}
\frac{d\tilde{Y}}{d\omega} =& \frac{dY}{d\omega} - \mu\frac{d(rE^o)}{d\omega} - \kappa\frac{dC}{d\omega} \\
=& - \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CW}} - \bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW} - \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CP_c}} - \bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c} \\
&+ [F_{k,C} - F_{k,P_u}]\left(\eta_{k_C,\omega}K_C - \bar{k}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c} - \bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right) \\
&+ \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CW}} - \bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW} + \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CP_c}} - \bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c} \\
&- \mu r\lambda\eta_{k_C,\omega}K_C - \mu\frac{dr}{d\omega}[\lambda K_C - \bar{a}_C C] \\
=& [F_{k,C} - F_{k,P_u}]\left(\eta_{k_C,\omega}K_C - \bar{k}_{C,\overrightarrow{CP_c}}\overrightarrow{CP_c} - \bar{k}_{C,\overrightarrow{CW}}\overrightarrow{CW}\right) \\
&- \mu r\lambda\eta_{k_C,\omega}K_C - \mu\frac{dr}{d\omega}[\lambda K_C - \bar{a}_C C]
\end{aligned}$$

Hence,

$$\frac{d\tilde{Y}}{d\omega} = r\lambda(\omega+\mu)\frac{dK_C}{d\omega} - \Bigg(\underbrace{\mu r\lambda\eta_{k_C,\omega}K_C + \mu\frac{dr}{d\omega}[\lambda K_C - \bar{a}_C C]}_{=\frac{dEIC_{CC}}{d\omega}}\Bigg),$$

where EIC_{CC} denotes the total equity issuance costs of infra-marginal C corporations, that is of C corporations who continue as such after a marginal increase in ω. Hence, the semi-elasticity of gross income with respect to ω is given by

$$\eta_{\tilde{Y},\omega} = \frac{r\lambda(\omega+\mu)K_C}{\tilde{Y}}\eta_{K_C,\omega} - \frac{EIC_{CC}}{\tilde{Y}}\eta_{EIC_{CC},\omega}.$$

□

A.5 Proof of Proposition 4

Proof. Total revenue in this economy is given by the sum of personal-, dividend-, and corporate income tax revenue,

$$R = R_i + R_d + R_c.$$

Personal income tax revenue is given by

$$R_i = \tau_i\left[Y_{P_c} + Y_{P_u} + Y_C - \frac{r^e}{1-\tau_c}\lambda K_C - \kappa C - \mu r E^o\right],$$

that is by total output $Y = Y_C + Y_{P_C} + Y_{P_u}$ minus gross corporate profits $\frac{r^e}{1-\tau_c}\lambda K_C$ as well as incorporation and equity issuance costs. Using the no-arbitrage equation (5) and the definition of gross income $\tilde{Y}$ this is the same as

$$R_i = \tau_i\left[\tilde{Y} - (1+\omega)r\lambda K_C\right]$$

The sum of corporate income and dividend tax revenue is given by

$$R_c + R_d = \left[\tau_c + (1-\tau_c)\tau_d\right]\frac{r^e}{1-\tau_c}\lambda K_C,$$

since gross corporate profits are first taxed at rate τ_c and the distributed dividends, that is a share $(1-\tau_c)$ of gross profits are taxed at rate τ_d. Using the no-arbitrage equation (5) this is the same as

$$\begin{aligned}
R_c + R_d =& \left[\tau_c + (1-\tau_c)\tau_d\right]\frac{(1-\tau_i)}{(1-\tau_c)(1-\tau_d)}r\lambda K_C \\
=& (1-\tau_i)\frac{\tau_d(1-\tau_c)+\tau_c}{(1-\tau_c)(1-\tau_d)}r\lambda K_C \\
=& (1-\tau_i)\frac{(1-\tau_c)(\tau_d-1)+1}{(1-\tau_c)(1-\tau_d)}r\lambda K_C \\
=& (1-\tau_i)\left[\frac{1}{(1-\tau_c)(1-\tau_d)} - 1\right]r\lambda K_C
\end{aligned}$$

$$= \underbrace{\left[\frac{1-\tau_i}{(1-\tau_c)(1-\tau_d)} - 1\right]}_{\equiv \omega} r\lambda K_C + \tau_i r \lambda K_C.$$

Hence total government revenue can be parsimoniously written as

$$R = \tau_i \tilde{Y} + (1-\tau_i)\omega r \lambda K_C. \tag{A.16}$$

The change in total revenue due to a marginal increase in the corporate tax rate is given by

$$\frac{dR}{d\tau_{\tilde{c}}} = \tau_i \frac{d\tilde{Y}}{d\tau_{\tilde{c}}} + (1-\tau_i)\frac{d\omega}{d\tau_{\tilde{c}}} r\lambda K_C + (1-\tau_i)\omega \frac{dr}{d\tau_{\tilde{c}}} \lambda K_C + (1-\tau_i)\omega r \lambda \frac{dK_C}{d\tau_{\tilde{c}}}.$$

Note that this can be written as

$$\eta_{R,\tau_c} = \tau_i \eta_{\tilde{Y},\tau_{\tilde{c}}} \frac{\tilde{Y}}{R} + \frac{(1-\tau_i) r \lambda K_C}{R} \left[1 + \omega(\eta_{r,\omega} + \eta_{K_C,\omega})\right] \frac{d\omega}{d\tau_{\tilde{c}}}.$$

Next, recall that

$$\omega = \frac{1-\tau_i}{1-\tau_{\tilde{c}}} - 1$$

and therefore

$$\frac{d\omega}{d\tau_{\tilde{c}}} = \frac{(1-\tau_i)}{(1-\tau_{\tilde{c}})^2} = \frac{1+\omega}{1-\tau_{\tilde{c}}}.$$

Hence, we have

$$\eta_{R,\tau_c} = \tau_i \eta_{\tilde{Y},\tau_{\tilde{c}}} \frac{\tilde{Y}}{R} + \frac{(1-\tau_i) r \lambda K_C}{R} \left[1 + \omega(\eta_{r,\omega} + \eta_{K_C,\omega})\right] \frac{1+\omega}{1-\tau_{\tilde{c}}}.$$

Furthermore, since

$$\frac{(1-\tau_i) r}{1-\tau_{\tilde{c}}} = \frac{(1-\tau_d) r^e}{1-\tau_{\tilde{c}}} = \frac{(1-\tau_d) r^e}{(1-\tau_c)(1-\tau_d)} = \frac{r^e}{1-\tau_c} \equiv \tilde{r}^e.$$

this is the same as

$$\eta_{R,\tau_{\tilde{c}}} = \tau_i \eta_{\tilde{Y},\tau_{\tilde{c}}} \frac{\tilde{Y}}{R} + \frac{\tilde{r}^e \lambda K_C}{R} \left[1 + \omega(\eta_{r,\omega} + \eta_{K_C,\omega})\right] (1+\omega).$$

□

B Details on Equilibrium Effects of Tax Changes

B.1 Details on the Factor Price Responses

In this section, we present more details of the derivation of factor price responses that are intended to complement the formal proof in Appendix A with some more intuition for the reader. Since it is quantitatively the most important margin, we focus on factor reallocation at the intensive margin and hold occupation and organizational forms fixed, that is we impose Assumption 2.

Responses of Factor Demand - Unconstrained Pass-Throughs. Consider an unconstrained pass-through business, whose manager has ability θ. Total differentiation of the optimality condition for capital demand ($F_k(k_{P_u}(\theta), l_{P_u}(\theta), \theta) = r$) and that for labor demand ($F_l(k_{P_u}(\theta), l_{P_u}(\theta), \theta) = w$) yields a system of two equations that is equivalent to

$$\begin{aligned}
\eta_{k_{P_u}(\theta),\omega} &= -\frac{1}{\alpha_m}\left[\alpha_l \eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega}\right] \equiv \eta_{k_{P_u},\omega} \\
\eta_{l_{P_u}(\theta),\omega} &= -\frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k \eta_{r,\omega}\right] \equiv \eta_{l_{P_u},\omega}.
\end{aligned}$$

Observe that the relative changes in factor demand in unconstrained pass-throughs is independent of the owner-manager's ability θ. Pass-through businesses are affected by changes in the wedge only indirectly through equilibrium prices. A reduction in wages and interest rates would increase their demand for labor and capital. Furthermore, the demand responses are inversely proportional to the entrepreneurs income share α_m. Intuitively, the higher the entrepreneur's income share of production, the lower the price sensitivity in her factor demand. Observe that the cross-price effects are proportional to the share on the other factor, while the own-price effects are mitigated by the weight of the other factor due to capital-labor complementarity.

Responses of Factor Demand - C Corporations. Applying the same strategy to the factor demand conditions of C corporations gives

$$\begin{aligned}
\eta_{k_C(\theta),\omega} &= -\frac{1}{\alpha_m}\left[\alpha_l \eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega} + (1-\alpha_l)\frac{\lambda}{1+\lambda(\omega+\mu)}\right] \equiv \eta_{k_C,\omega} \\
\eta_{l_C(\theta),\omega} &= -\frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k \eta_{r,\omega} + \alpha_k \frac{\lambda}{1+\lambda(\omega+\mu)}\right] \equiv \eta_{l_C,\omega}.
\end{aligned}$$

Also the relative changes in factor demand in C corporations is independent of the owner-manager's ability θ. Relative to the conditions for unconstrained pass-throughs there is one crucial difference: An increase in the tax wedge has a direct impact on the cost of capital and thus reduces the demand for capital even in the absence of factor price changes. Due to the complementarity of capital and labor in prodcution, it also reduces the demand for labor. Specifically, the last term in both expressions denotes the relative change in factor demand if only the tax wedge would change but prices were fixed. Note that the relative change in financing costs due to changes in the tax wedge, holding other variables fixed, is

$$\frac{\partial \log \left[r(1+\lambda(\omega+\mu))\right]}{\partial \omega} = \frac{\lambda}{1+\lambda(\omega+\mu)},$$

while the relative change in financing costs in equilibrium is

$$\frac{d \log \left[r(1+\lambda(\omega+\mu))\right]}{d \omega} = \eta_{r,\omega} + \frac{\lambda}{1+\lambda(\omega+\mu)}.$$

Responses of Factor Demand - Constrained Pass-Throughs. Finally, consider constrained pass-thoughs. As a consequence of the binding leverage constraint their capital demand is inelastic, that is $\eta_{k_{P_c}(\theta,a),\omega} = 0$ for each constrained pass through run by an entrepreneur with ability θ and assets $a \in (\underline{a}(\theta), \lambda k_{P_u}(\theta)$. Totally differentiating their optimality condition for labor demand gives

$$\eta_{l_{P_c}(\theta,a),\omega} = -\frac{1}{1-\alpha_l}\eta_{w,\omega}.$$

We observe to crucial differences relative to the labor demand reaction of unconstrained pass-throughs. First, naturally, the response is independent of the interest rate response. The reason is that constrained pass-throughs will not adjust their capital stock even if the interest rate changes and consequently the marginal product of labor is not affected by adjustments in capital. Second, the effect is inversely proportional to $1-\alpha_l$ rather than to the managerial output share α_m. The reason is that these firms do not pay their debt holders less then marginal product of capital and the difference is part of their income. As a result their marginal 'profit share' is not α_m but $\alpha_m + \alpha_k = 1 - \alpha_l$. As explained above a higher share of entrepreneurial income reduces the sensitivity to changes in the cost of labor.

Factor Market Clearing. One can then totally differentiate the factor market clearing conditions and use the results for the factor demand changes of the various types of firms above. The total derivative of the capital market clearing condition is then given by

$$-\left(\left[\frac{\alpha_l}{\alpha_m}\eta_{w,\omega} + \frac{1-\alpha_l}{\alpha_m}\eta_{r,\omega}\right](K_C + K_{P_u}) + \frac{1-\alpha_l}{\alpha_m}\frac{\lambda}{1+\lambda(\omega+\mu)}K_C\right) = 0. \tag{B.1}$$

As explained above, since the capital stock of constrained pass-throughs is inelastic only the relative demand effects of C corporations (weighted by their total capital stock K_C) and of unconstrained pass-throughs (weighted by their total capital stock K_{P_u}) show up.[B.1] Importantly, the last term that captures the change in capital demand of C corporations due to the mechanical increase in the financing costs is positive, implying that the weighted sum of the two price elasticities has to be negative to compensate for the drop in demand.

[B.1] Capital demand of constrained pass-through owned by an entrepreneur with ability θ and assets a is fixed at $\frac{a}{\lambda}$. The total mass of constrained pass-throughs may change despite Assumption 2 since factor price changes may result in some unconstrained pass-throughs becoming constrained. However, since for all θ capital demand is continuous at the asset threshold $\hat{a}(\theta) = \lambda k_{P_u}(\theta)$ this has a zero effect on total capital demand.

Similarly, the total derivative of the labor market clearing condition is

$$-\left(\left[\frac{1-\alpha_k}{\alpha_m}\eta_{w,\omega}+\frac{\alpha_k}{\alpha_m}\eta_{r,\omega}\right](L_C+L_{P_u})+\frac{\alpha_k}{\alpha_m}\frac{\lambda}{1+\lambda(\omega+\mu)}L_C+\frac{1}{1-\alpha_l}\eta_{w,\omega}L_{P_c}\right)=0, \tag{B.2}$$

where L_C, L_{P_u} and L_{P_c} denote the total amount of effective labor employed in, respectively, C corporations, unconstrained pass-throughs and constrained pass-throughs. As explained before, while the latter firms do cannot adjust their capital they adjust their demand for labor in response to wage changes. Observe that if there were no constrained pass-throughs, that is if $L_{P_c}=0$, the two expressions (B.1) and (B.2) would be fully symmetric and have the same interpretation. The presence of constrained pass-throughs hence amplifies the labor demand effect of any change in the wedge.

Under Assumption 2 the change in the supply of production factors K, L and M is zero (right hand sides), while the changes in demand are given by the left hand sides. In equilibrium the factor price responses $\eta_{w,\omega}$ and $\eta_{r,\omega}$ need to be consistent with market clearing.

Solving the linear equation system (B.1) and (B.2) gives

$$\eta_{w,\omega}=-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\frac{\lambda}{1+\lambda(\omega+\mu)}\left[\frac{L_C}{L_C+L_{P_u}}-\frac{K_C}{K_C+K_{P_u}}\right]\frac{L_C+L_{P_u}}{L}$$

and

$$\eta_{r,\omega}=-\frac{\lambda}{1+\lambda(\omega+\mu)}\frac{K_C}{K_C+K_{P_u}}-\frac{\alpha_l}{1-\alpha_l}\eta_{w,\omega}.$$

Note that both the sign and the level of the semi-elasticity of wages with respect to the tax wedge crucially depend on the relative size of[B.2]

$$\frac{L_C}{L_C+L_{P_u}}-\frac{K_C}{K_C+K_{P_u}}=\frac{\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\geq 0, \tag{B.3}$$

a term that measures the degree of misallocation in the economy.

[B.2] Note that with a Cobb-Douglas production function we have

$$\frac{L_C}{L_C+L_{P_u}}=\frac{wL_C}{wL_C+wL_{P_u}}=\frac{\alpha_l Y_C}{\alpha_l Y_C+\alpha_l Y_{P_u}}=\frac{Y_C}{Y_C+Y_{P_u}},$$

as well as

$$\frac{K_C}{K_C+K_{P_u}}=\frac{rK_C}{rK_C+rK_{P_u}}=\frac{\frac{\alpha}{1+\lambda(\omega+\mu)}Y_C}{\frac{\alpha}{1+\lambda(\omega+\mu)}Y_C+\alpha Y_{P_u}}=\frac{1}{\lambda(\omega+\mu)\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{Y_C}{Y_C+Y_{P_u}},$$

which together imply the result.

B.2 Details on the Gross Income Response

As discussed in Section 3.3, in response to an increase in the tax wedge ω gross income $\tilde{Y}$ falls as the reduction in output Y due to the misallocation of production factors outweighs the savings in equity issuance and incorporation costs. In this Appendix, we characterize the changes in these respective components in more detail.

Denote the total incorporation- and equity issuance costs of marginal C corporations, that is those C corporations which upon a marginal increase in ω either change their organizational form, or completely exit, by

$$cost_{\overrightarrow{CP_c},\overrightarrow{CW}} \equiv \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CP_c}} - \bar{a}_{\overrightarrow{CP_c}}\right)\right]\overrightarrow{CP_c} + \left[\kappa + \mu r\left(\lambda \bar{k}_{C,\overrightarrow{CW}} - \bar{a}_{\overrightarrow{CW}}\right)\right]\overrightarrow{CW}.$$

As is shown in the proof of Proposition 3, the relative output loss due to a marginal increase in ω can then be written as

$$\eta_{Y,\omega} = \frac{r\lambda(\omega+\mu)K_C}{Y}\eta_{K_C,\omega} - \frac{cost_{\overrightarrow{CP_c},\overrightarrow{CW}}}{Y},$$

or, in absolute terms,

$$\frac{dY}{d\omega} = r\lambda(\omega+\mu)\frac{dK_C}{d\omega} - cost_{\overrightarrow{CP_c},\overrightarrow{CW}}.$$

The first term captures the output loss due to the reallocation of capital ($\eta_{K_C,\omega} \leq 0$) from more productive C corporations to less productive pass-throughs. This term is strictly negative unless $\omega = \mu = 0$.

The second term increases the output loss further. For owner-managers of C corporations, who are at the margin of switching organizational form or occupation, these costs are exactly equal to the income differential, relative to being owner-manager of a pass-through, respectively relative to being a worker. That is, prior to the increase in ω, the additional managerial income generated in these C corporations made their owner-managers just indifferent between running a C corporation or a pass-through, respectively between running a C corporation or becoming a worker. Now the increase in ω makes these agents no longer willing to suffer these costs, reducing output by exactly that amount. This saves these agents the costs from incorporation and equity issuance. However, since these costs are not included in the definition of output Y, these cost savings do not offset the managerial income loss.

Now, aggregate net income $\tilde{Y}$ equals output minus costs from incorporation and equity issuances,

$$\tilde{Y} = Y - \mu r E^o - \kappa$$

and its change due to an increase in ω is given, in absolute terms, by

$$\frac{d\tilde{Y}}{d\omega} = \frac{dY}{d\omega} + cost_{\overrightarrow{CP_c},\overrightarrow{CW}} - \Big(\underbrace{\mu r \lambda \eta_{k_C,\omega} K_C + \mu \frac{dr}{d\omega} [\lambda K_C - \bar{a}_C C]}_{=\frac{dEIC_{CC}}{d\omega}} \Big)$$

$$= r\lambda(\omega+\mu)\frac{dK_C}{d\omega} \underbrace{-cost_{\overrightarrow{CP_c},\overrightarrow{CW}} + cost_{\overrightarrow{CP_c},\overrightarrow{CW}}}_{=0} - \frac{dEIC_{CC}}{d\omega}$$

where EIC_{CC} denote the total equity issuance costs of infra-marginal C corporations, that is of C corporations who continue as such after a marginal increase in ω. Observe that

$$\frac{dEIC_{CC}}{d\omega} < 0$$

as the lower corporate capital stock saves some equity issuance costs. Furthermore, since owner-managers of marginal C corporations are, in response to an increase in ω no longer willing to bear the costs $cost_{\overrightarrow{CP_c},\overrightarrow{CW}}$, total aggregate income is increased by this amount. However, as discussed above, this just offsets the income differential these marginal agents have received prior to the increase in the tax wedge.

Hence, the semi-elasticity of gross income with respect to ω is given by

$$\eta_{\tilde{Y},\omega} = \frac{r\lambda(\omega+\mu)K_C}{\tilde{Y}}\eta_{K_C,\omega} - \frac{EIC_{CC}}{\tilde{Y}}\eta_{EIC_{CC},\omega},$$

a weighted difference of the reduction in corporate capital $\eta K_C, \omega < 0$ and the savings in equity issuance costs of inframarginal C corporations $\eta_{EIC_{CC},\omega} < 0$.

C Details on the Calibration

We set several parameters exogenously. Specifically, we use the effective tax rates reported by Auerbach (2018), that is an effective tax rate on pass-through income of $\tau_i = 0.27$ and an effective tax rate of $\tau_{\tilde{c}} = 0.31$ on the profits of C corporations. This implies an effective tax wedge of $\omega = 0.058$. Lacking clear empirical guidance, we assume that wealth is independently distributed from the two abilities. In particular, we assume it follows a log normal distribution combined with a Pareto tail at the top that is calibrated to closely match the observed wealth distribution in the United States, as Table 6 shows.

Wealth holdings of...	bottom 50%	top 10%	top 1%	top 0.1%	top 0.01%
Data (SCF 2019)	0.012	0.771	0.386	0.148	0.053
Model	0.011	0.773	0.322	0.131	0.051

Table 6: Wealth distribution

The marginal distributions for working and entrepreneurial abilities are assumed to follow a two-dimensional log-normal distribution combined with Pareto tails at the top. The correlation between the to abilities is set to 0.15 following Allub and Erosa (2019). The variance of the marginal distribution of ν is normalized to one and the tail parameter calibrated to closely match the observed earnings distribution of workers. Similarly, the tail parameter of the marginal distribution of θ is set to closely match the observed earnings distribution of business owners. Table 7 summarizes the income shares for workers and entrepreneurs in the data and the model.

	bottom 50%	top 20%	top 10%	top 1%	top 0.1%	top 0.01%
Workers:						
Data (SCF 2019)	0.156	0.588	0.443	0.191	0.080	0.028
Model	0.138	0.636	0.484	0.191	0.076	0.029
Entrepreneurs:						
Data (SCF 2019)	0.111	0.704	0.575	0.238	0.070	0.020
Model	0.138	0.590	0.441	0.172	0.067	0.023

Table 7: Income shares

This leaves six free parameters, which are calibrated to match six relevant targets, which are summarized in Table 8. The income shares are taken from the SCF 2019, where we define ownership of a pass-through business as those individuals who report to have an active management interest in a pass-through business and to own a strictly positive amount of its shares. The fraction of C corporation among all businesses (5%) as well as the income share of C corporations (44%) are taken from the article of Auerbach (2018). Finally, according to Kaplan and Zingales (1997) 40% of businesses are never in their life-cycle constraint. We hence target a share of 40% of non-corporate income, that is 22.4% of aggregate production, to be generated by unconstrained pass-throughs.

Target	Data	Model
Share of total income earned by owners of pass-throughs	0.208	0.171
Capital income earned by all other agents as fraction of aggregate income	0.140	0.175
Share of PT entrepreneurs	0.066	0.106
Fraction of C corporations among all businesses	0.050	0.049
Income share of C corporations among all businesses	0.440	0.427
Income share of unconstrained pass-throughs among all businesses	0.224	0.187

Table 8: Calibration targets

Table 9 summarizes the corresponding parameter values that optimize this joint calibration problem.

Parameter	Description	Value
α^m	manager share in production	0.044
α^l	labor share in production	0.616
σ_θ	variance of entrepr. ability	0.931
κ	Fixed cost of running a C corporations	0.956
μ	equitiy issuance cost	0.500
λ	equity requirement	0.438

Table 9: Calibrated parameters