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

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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. In a seminal paper, Harberger (1962) finds that in a 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 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 regarding the distributional consequences of corporate taxation (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, 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 and a fixed population as in Harberger (1962). These modeling choices affect our find-

[1] Indeed, the Congressional Budget Office had imputed a zero share of corporate tax incidences on labor until 2012. They have increased it to 25 percent. According to Auerbach (2018) this was due to considerations 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.

ings. 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, C corporations 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 entrepreneurs to 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, the maximum allowed number of shareholders for pass-through businesses depends on the type of the pass-through (sole proprietorship, partnership, S-corporation, limited liability company). We abstract from these pass-through subtypes and assume that the business founder is the only shareholder in a pass-through, while C corporations

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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.

can issue outside equity and have arbitrarily many shareholders.[4] 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.

Furthermore, a consequence of the above mentioned shift in the composition of US businesses is that nowadays pass-through businesses operate in the same industries and produce similar goods as C corporations (Yagan, 2015; Smith et al., 2023). Hence, we make the simplifying assumption that all firms employ the same technology and 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. 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 individual agents. An important feature of our framework is that we differentiate between workers (employees) and entrepreneurs as they enter the production function as different inputs. This is key because a consequence 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 capital costs in C corporations, reducing their demand for capital. In equilibrium, the interest rate declines and some pass-throughs that are not debt constrained 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.

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 are a function of managerial ability only. In this special case, the burden of the corporate tax increase falls fully on capital owners.[5] When capital and labor are reallocated from C corporations to pass-throughs as a response to an increase in corporate taxes, wages and aggregate pro-

[4] This is a good approximation of reality. According to the SCF 2019, owner-managers of pass-through businesses own on average 86.3% of their business. 71.1% of them are the sole shareholder, and only 1.3% of them own less than 50%. This pattern is homogeneous across the firm size distribution, and also holds for the largest businesses.

[5] In Harberger (1962) capital may theoretically bear more or less than 100% of the corporate tax incidence as 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. See Appendix D for more details on the relationship between our framework and Harberger's.

duction 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 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, production factors are misallocated. Conditional on entrepreneurial ability, C corporations employ less capital and less labor than unconstrained pass-throughs. Furthermore, some 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 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 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 were workers, switch 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.

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 of the effects in a calibrated model.

Main Results. Our model's main predictions are in stark contrast with the classical results in the literature. In our baseline 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, 82% of the corporate tax incidence falls on labor. While the incidence on capital equals 88%, the incidence share on the entrepreneurial input of owner-managers is negative (−70%). Thus, on average, entrepreneurs gain from the corporate tax increase. However, this aggregate effect on managerial income masks underlying heterogeneity. 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.

We apply our framework to study the long-run distributional impact of the TCJA, which we approximate as a 3 percentage point reduction in the effective tax rate on corporate profits. This tax cut increases net income for all income brackets on average. However, even though workers' wages increase, while those of managers (on average) decline, the tax cut is not progressive: while the net income of the bottom 80% increases by 0.08-0.10%, the top 10% of the income distribution experience a gain of 0.18%. These numbers reflect that the corporate tax incidence falls to a substantial extent on labor. Yet, the stronger effect at the top results from the fact that owner-managers of C corporations are clustered at the top of the income distribution.

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 effects on 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

[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 (2023). Their focus, however, is different, as they study the effects of changing top income tax rates in the presence of tax avoidance.

(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).

We also relate to a literature that studies the effect of taxation on entrepreneurial activity. Recently, Gordon and Sarada (2018) as well as Akcigit et al. (2022) study the optimal tax design in the presence of market failures. Common to our framework is that these market failures, in our case limited access to external funds, result in underprovision of entrepreneurship. Empirically, various studies, using data from a multitude of countries, find negative effects of, respectively, corporate- and personal income taxes on the entry of corporations and non-incorporated business (Gentry and Hubbard, 2000; Cullen and Gordon, 2007; Djankov et al., 2010; Da Rin et al., 2011; Wen and Gordon, 2014; Venancio et al., 2020; Can, 2021; Arulampalam and Papini, 2023; etc.). This evidence motivates our choice to explicitly model the occupational margin.

The theoretical literature on corporate tax incidence has been rather silent recently. 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. 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 corporate tax incidence.

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. Agents that are heterogeneous in abilities and wealth first decide on their occupation, worker or entrepreneur. Next, entrepreneurs decide the legal form of their firm (pass-through or C corporation), taking financial frictions and differential taxes into account. Finally, all firms choose their investment level and their financing structure, the optimal mix of inside equity, debt, and outside equity. The main objective is to obtain sharp analytical insights on the main trade-offs affecting these choices. Hence, for tractability, we restrict our attention to a deterministic and static environment. In Section 5 we outline how our analysis is affected when introducing risk, while in the conclusion (Section 6) we briefly discusses the consequences of introducing dynamics and capital accumulation.

[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.

2.1 Set-Up

Demographics. There is a continuum of agents of measure one, who differ in their initial wealth a, managerial ability θ, and working ability ν. We assume that the joint distribution of these variables, $\Gamma(a, \theta, \nu)$, is continuous, and denote by γ the density.

Preferences. Agents have preferences over consumption that are strictly increasing. Since the baseline model is static and deterministic, they simply maximize after-tax income. On this basis, agents choose their occupation, whether to be a worker or entrepreneur, and in the latter case also the legal form, production inputs, and financial structure of their firm. In the baseline model we assume that agents supply their labor/effort inelastically but we will relax this assumption in the robustness analysis.

Technology. Each agent has access to the same production technology $F(k, l, m)$, 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 $F_{xy} > 0$. We abstract from capital depreciation, and capital can be converted one-for-one into the consumption good.

Legal form of firms. There are two possible organizational forms of firms: pass-throughs and C corporations. We assume, based on the US legal framework, that they differ in two aspects.[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 relative to pass-throughs to issue outside equity, since C corporations do not face restrictions on the number of shareholders while pass-throughs do. To capture this in a stark way, we assume that pass-throughs are unable to raise any outside equity.

Financial Frictions. All firms can use the entrepreneur's own assets a and debt to fund their capital investment 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 at least a share $\lambda > 0$ of their capital stock with equity e,

$$e \geq \lambda k(a, \theta, \nu). \tag{1}$$

[9] The differences in taxation and financial constraints across legal forms of firms vary across countries. We model the situation in the U.S. for comparability with the previous literature (see e.g. Harberger (1962) or more recently Dyrda and Pugsley, 2019). Nevertheless, our analysis can be easily adjusted to account for different tax systems and financial arrangements.

[10] In the U.S., pass-throughs owners are subject to personal income taxes independently of whether the income generated by their firm is reported as business income or managerial salary. In the analysis we abstract for simplicity from the temporary 20% tax deduction on certain pass-through income that was legislated as part of the TCJA and expires in December 2025.

Only C corporations can issue outside equity (e^o). 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.[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, 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 salary paid to the entrepreneur, as well as interest on debt, are deductible from firm revenue. We assume for tractability that all taxes are linear. Effectively, C corporations profits are taxed at the rate $\tau_{\tilde{c}}$ that combines corporate and dividend taxes:

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

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*

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

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. An increase in tax rates that keeps ω unchanged affects only government revenue and individual consumption, but not occupational choices and neither the allocation of production factors.

2.2 Individual Optimization

Figure 2 summarizes the decision problem. Each agent, given her wealth a and abilities (θ, ν), decides to become an entrepreneur (E) or worker (W) to maximize consumption:

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

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

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.

In turn, $c^E(a,\theta)$ reflects the optimal organizational form of the firm. Denoting by $c^C(a,\theta)$ the consumption attainable when organizing as C corporation (C) and by $c^P(a,\theta)$ when operating as pass-through (P), we have:

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

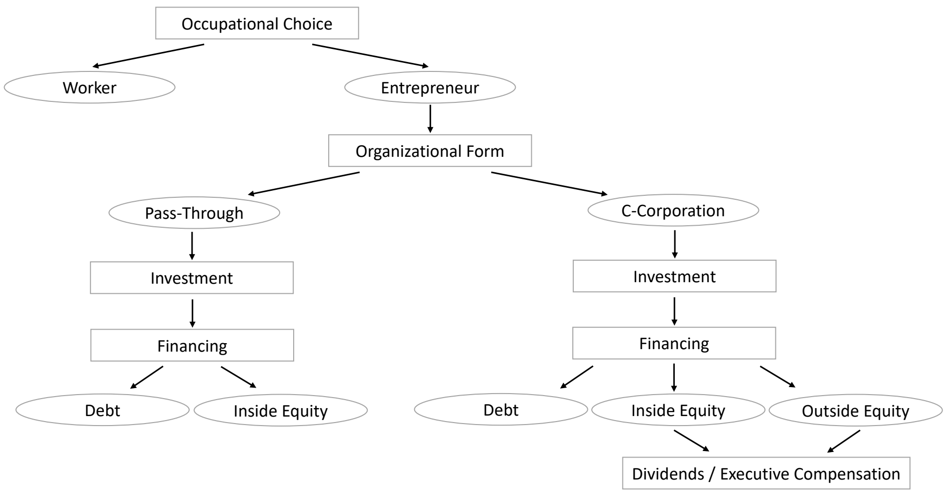

Figure 1: Individual Decision Tree

2.2.1 Owner-Managers of Pass-Through Businesses

We first examine the problem of a pass-through owner. The (unconstrained) optimal labor demand conditional on the level of capital k and managerial talent θ is given by

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

Optimality requires equating 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 $k \le \frac{a}{\lambda}$.

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 borrowing constraint binds. Even when the entrepreneur invests all her wealth into her firm, the marginal product of capital exceeds the interest rate r. Thus, optimal investment is $k = a/\lambda$. We refer to these firms as *constrained pass-throughs.* In case (ii), the borrowing constraint is slack. Capital is optimally set at $k^*(\theta)$ such that $F_k(k^*(\theta), l(k^*(\theta),\theta),\theta) = r$. We refer to these firms as *unconstrained pass-throughs.*

We note some key insights. First, while unconstrained pass-throughs' investment only depends on the entrepreneur's managerial ability θ (independent of wealth a), constrained pass-throughs' investment is increasing in a (and does not vary with θ).

Second, pass-throughs' input choices are independent of taxes. Hence, the tax wedge affects them only indirectly through its effect on equilibrium factor prices r and w.

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

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. Computing the tax incidence by production factor requires decomposing entrepreneurs' income into capital and managerial income. While disentangling these two empirically is difficult, in our model we naturally define capital income of *all* agents as the product of their wealth and the interest rate, ra.[12]

Both for unconstrained and for constrained pass-through owners, denoted by $X \in \{u, c\}$, managerial income can then be written as

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

where $(k_{P_X}(\theta), l_{P_X}(\theta))$ denotes optimal factor demand and $w^m_{P_X}$ is the managerial wage rate per efficiency unit θ. Observe that $w^m_{P_u}$, the wage for unconstrained owners, is independent of (a,θ) due to the wealth-invariance of factor demand in unconstrained businesses and due to constant returns to scale. By contrast, since a constrained pass-through's capital demand depends on wealth, $k_{P_c}(\theta) = \frac{a}{\lambda}$, its owner-managers' wage rate per efficiency unit $w^m_{P_c}(a,\theta)$ depends on her characteristics (a,θ).

[12] While this choice affects the 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.

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.

Compared to pass-throughs, C corporation owners decide not only on capital k and labor l inputs and the amount of debt, but also how much outside equity e^o to issue.

Furthermore, the division of post-tax profits between managerial compensation and dividends to equity holders has non-trivial tax implications. Entrepreneurs must provide a dividend r^e to shareholders (including themselves) such that the after-tax return on equity is not dominated by the net return on debt: $(1-\tau_i)r \leq (1-\tau_d)r^e$. The presence of the 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:

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

If they did not issue any outside equity, C corporations owners could in theory replicate the tax treatment of pass-throughs by setting the managerial salary high enough such that residual profits are zero. However, this is irrelevant in equilibrium since due to the fixed incorporation cost κ these agents are better off as pass-through owners. Consequently, in equilibrium all C corporations issue outside equity, $e^o > 0$.

The tax wedge and the outside equity issuance cost also imply that debt and inside equity are preferred to outside equity. Thus, entrepreneurs use outside equity only once they invested all their wealth as inside equity, $e^i = a$, and the debt constraint binds. Thus, there is a pecking order of funds, and Lemma 1 follows:

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

Due to the tax wedge, the owner would like to pay herself as much as possible through salaries.[13] Thus, the managerial wage income in C corporations $\theta w^m_C(a,\theta)$ satisfies

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

After-tax profits are just enough to cover the total dividends paid out to external and

[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).

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 capital is always r. Both $\mu > 0$ and $\omega > 0$ increase the marginal cost of capital in proportion to the equity requirement λ. The solution of the above problem yields $c^C(a,\theta)$.

The optimality condition with respect to investment is

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

This condition implies that equilibrium investment at C corporations is a function of θ only, and does not depend on the entrepreneur's wealth a. Furthermore, the marginal cost of capital in C corporations is higher than in pass-throughs. It follows that, conditional on θ, C corporations are smaller than unconstrained pass-throughs, the more so the larger μ and ω. Entrepreneurs find it optimal to form a C corporation only when their wealth a is low enough (and/or θ high enough) 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 outside equity issuance depends on the entrepreneurs' wealth, her managerial wage $w_C^m(a,\theta)$ depends on her characteristics (a,θ). However, since the marginal products of labor and capital are equalized across all C corporations, by Euler's theorem, the marginal product of management $\hat{w}_C^m$ is also equalized, and does not depend on the entrepreneurs' wealth. Denoting a C corporation's factor demand by $(k_C(\theta), l_C(\theta))$, Euler's theorem implies

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

We refer to $\hat{w}_C^m$ as the entrepreneur's *shadow wage*, which is independent of wealth. The actual wage $w_C^m(a,\theta)$ also accounts for incorporation costs and the wealth dependence of equity issuance costs. Using Euler's theorem and equation (6) yields

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

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

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

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 $k_C(\theta) > \frac{\underline{a}(\theta)}{\lambda}$.[14]

Summarizing, we 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 fixed θ, the organizational form as a function of wealth. The left panel depicts the marginal product of capital, and the right panel 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.

In equilibrium, the marginal cost of funds is higher for C corporations than for pass-through businesses. However, this is because the only source of external funds of the

[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.

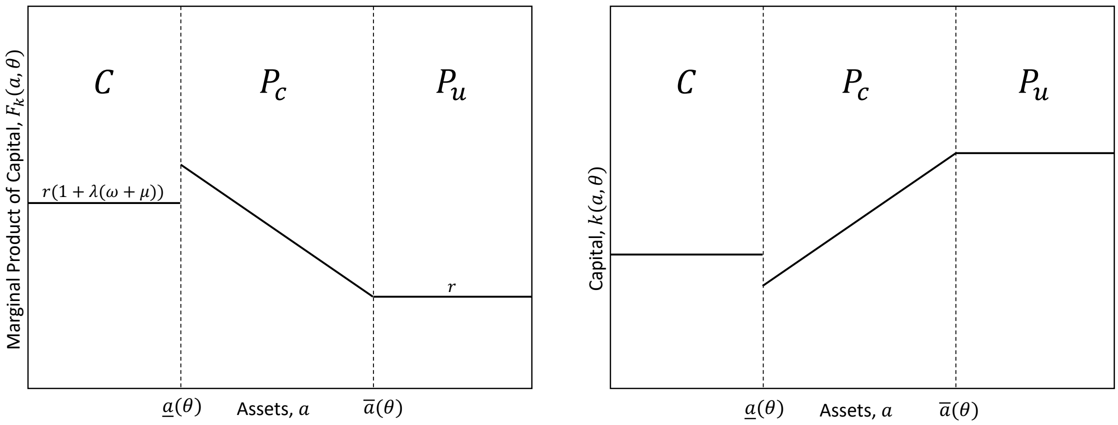

Figure 2: Capital demand as a function of a (given θ)

latter is debt (which is cheaper), while the former can also issue outside equity (which is more costly). Thus, pass-through businesses implicitly face an infinite cost of issuing outside equity. Furthermore, in our static environment all firms are start-ups and the only reason why entrepreneurs choose the organizational form of a C corporation is precisely the need to raise more external funds by issuing outside equity. In reality, mature C corporations are often able to finance their marginal investment through retained earnings rather than through new equity issuance, or face lower borrowing costs due to lower informational frictions. However, the same argument should also hold for mature and large pass-throughs. Hence, it is not obvious that this influences the choice of legal form at the founding stage.

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.

Occupational choice. Each agent chooses the occupation that maximizes consumption,

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

When an agent's wealth is sufficiently high relative to her managerial talent, $a \geq \underline{a}(\theta)$, the choice is between running a pass-through firm and being a worker. Given prices, this choice depends only on the agent's comparative advantage θ/ν, when her wealth satisfies $a \geq \bar{a}(\theta)$. 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.

Financial constraints generate a misallocation of talent as some agents with high managerial ability and low 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,

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

By Walras' law, the 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 them. Asset market clearing then boils down to a single condition: the sum of debt and outside equity issued by firms equals the wealth of workers and the residual wealth of entrepreneurs not invested in their own firm.

3 Equilibrium Effects of Tax Changes

In this section, we analytically study the equilibrium effects of tax changes, to set the stage for the analysis of tax incidence across production factors and occupations.

When fixing prices, an increase in the tax wedge ω affects C corporations only. The percentage change in their cost of capital q due to a marginal increase in 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 C corporations less attractive, leading to a shift out of the corporate sector to constrained pass-throughs. Since C corporations have greater access to funds (given θ), this reallocation further lowers capital demand. Figure 3 displays these effects.

The reduction in capital demand triggers equilibrium responses of factor prices, man-

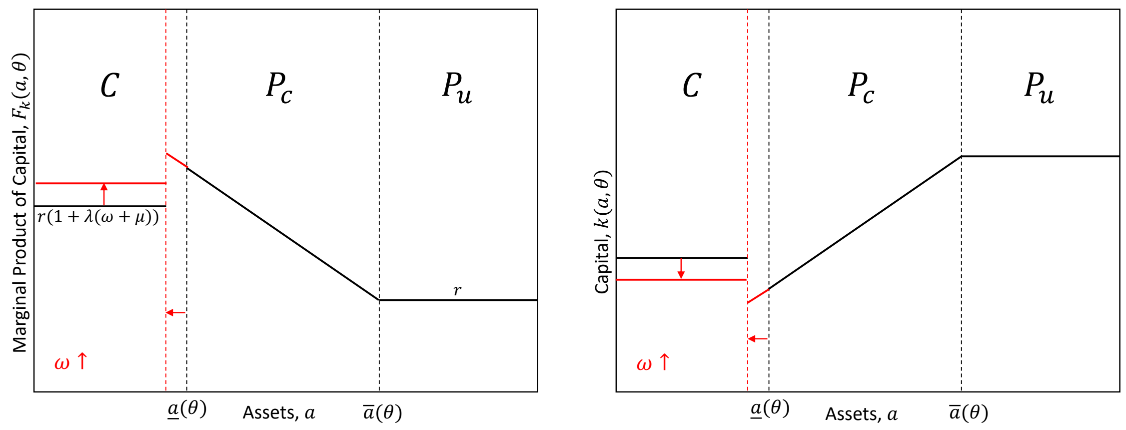

Figure 3: Partial equilibrium effect of increasing ω on capital demand

agerial compensation, aggregate income, and revenue, as we discuss below.

To allow for tractable comparative statics, we will from now on focus on the case where the production function is Cobb-Douglas:

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

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 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.

We denote by K_X, L_X and M_X, for $X \in \{C, P_c, P_u\}$, 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 who change occupations/organizational form from X to Y in response to a marginal increase in ω.[15]

As mentioned, the tax wedge ω is a sufficient statistic for the impact of taxes on the equilibrium allocation of production factors. Thus, we first characterize the changes of any equilibrium variable x as a semi-elasticity with respect to the tax wedge,

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

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

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

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

3.1 The Effect on Wages and Interest Rates

We start with deriving the effects on wages and interest rates, $\eta_{w,\omega}$ and $\eta_{r,\omega}$. It is instructive to first consider the special case with locally fixed occupations/organizational form:

Assumption 2. *In the initial equilibrium the mass of agents that is indifferent between occupations or organizational forms is equal to zero.*

The drop in C corporations' capital demand requires the interest rate to decline, such that unconstrained pass-throughs 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 labor market clearing. In turn, the decline in wages increases capital demand by both types of firms, mitigating the decline in the interest rate.

If changes in occupation and organizational form also take place, some owner-managers of C corporations decide to reorganize or to become workers, while some workers 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 in the two cases.

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*

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

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

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

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 assuming 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 ($C > 0$ and $P_u > 0$). From (9), 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, implying that the reallocation of capital operates only between C corporations and unconstrained pass-throughs.

Notice that $\eta_{w,\omega} < 0$ also requires 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, we 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, $\tilde{\eta}_{q,\omega}$, moves wages in the opposite direction. Thus, the reallocation of economic activity from C corporations to unconstrained pass-throughs lowers labor demand. For factor markets to clear, wages must decline.

Turning to the effects on the interest rate, 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 absorb if the interest rate drops sufficiently. 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 factor complementarity, 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. Appendix B.1 discusses the factor price responses with 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. Equations (11) and (12) show that the response of wages and the interest rate is given by the expressions of Part 1 ($\hat{\eta}_{w,\omega}$ and $\hat{\eta}_{r,\omega}$) plus some additional terms that account for the induced changes in occupation and legal form. These switches are depicted in Figure 4.

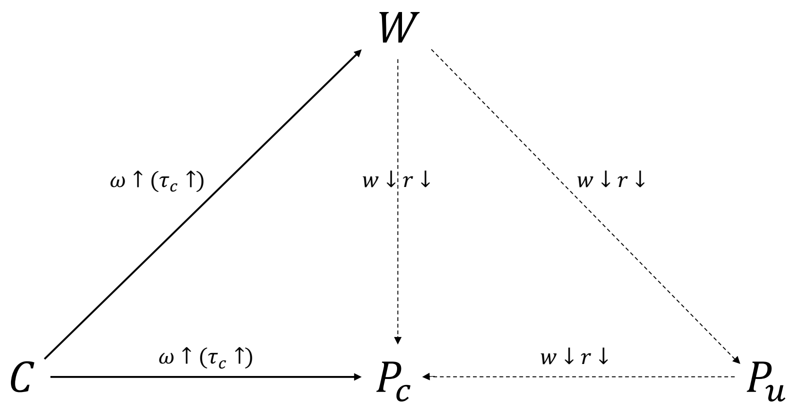

Figure 4: Switches in Organisation Form and Occupation

Change in Organizational Form. The horizontal line in Figure 4 describes changes in firms' legal form. First, the increase in the cost of capital implied by the increased tax wedge induces some C corporation owners to reorganize as 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

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

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

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 in labor and capital demand of these firms implies a drop in wages and interest rates, reflected by the first term in each of the two equations above. The respective second term in the two equations above reflects that the decline in the price of one factor increases the demand for the other factor; thus, it has the opposite sign. Since capital demand of constrained pass-throughs is inelastic, the effect of lower capital demand 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 wage changes, we prove in Appendix A that the first, direct, effect always dominates such that the effect of legal form changes on wages is negative. For the interest rate, we show numerically that the effect is negative in our calibrated economy as well.[16]

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 labor, excess labor supply increases further. As a consequence, a larger wage decrease is needed to restore equilibrium in the labor market. This first effect is again partially offset by the price reduction of the other factor. Again, for the case of wage changes, we show analytically that the first, negative, effect dominates, such that 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 ($P_x = P_u$). The corresponding effects are

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

[16] The change in prices may also change the fraction of constrained pass-throughs. In particular, some previously unconstrained pass-throughs 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.

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 F.1, the managerial wage rate per efficiency unit θ is homogeneous across unconstrained pass-throughs only. However, 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; the difference contributes to the entrepreneur's income. 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, the managerial wage in these firms equals

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

Hence, entrepreneurs are 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 induce a redistribution from workers and capital owners towards entrepreneurs. Moreover, C corporations owners are directly affected through a mechanical increase in their financing costs. 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:*

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

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. The managerial wage change is inversely proportional to management's share of output α_m, because the higher the management share in production, the less capital and labor is used, implying that the manager's income is less sensitive to the interest rates and to 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 corporation ($w^m_C(a,\theta) = \hat{w}^m_C$), implying that

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

Thus, in that case the only difference to the managerial wage change in unconstrained pass-throughs $\eta_{w^m_{P_u},\omega}$ 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, abstracting 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 $\eta_{w^m_C(a,\theta),\omega} = \eta_{\hat{w}^m_C,\omega}$ 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. 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*

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

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 $\mu > 0$ or $\kappa > 0$ the change in gross income 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. Appendix B.2 discusses 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 on revenue depends on the full set of tax changes, not only on the tax wedge ω. In the following, we focus on 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, 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 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, 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. This effect equals the product of the mechanical effect and $\omega(\eta_{K_C,\omega} + \eta_{r,\omega})$. 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, the 'misallocation' effect, captures that gross income decreases, reducing the overall tax base.

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 100% of the corporate tax incidence falls on capital. The reason is the same as in Harberger (1962): a (small) increase in the cost of funds of C corporations reduces the demand for capital, implying that in order to restore equilibrium on the capital market the interest rate needs to fall. Absent initial misallocation wages are unaffected.[17]

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,*

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

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,*

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

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*

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

[17] Note that although in Harberger (1962) there is no (initial) misallocation. Instead, in the most general version of his model discrepancies from this result may theoretically arise due to his assumption that C corporations and pass-throughs produce different goods using potentially different technologies, and that these goods have potentially different demand elasticities. However, for plausible parameterizations these discrepancies turn out to be quantitatively small. In Appendix D we provide details on the relationship between Harberger's framework and ours.

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 ratios 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 effects 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 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. 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.

3.6 Summary of Equilibrium Effects

Before moving to the incidence analysis we summarize the equilibrium effects of corporate tax changes. Table 1 shows the direction in which the equilibrium variables change. The left column characterizes the frictionless benchmark, in which the tax wedge is zero ($\omega = 0$), there are no costs from equity issuance and incorporation ($\mu = \kappa = 0$) and occupations as well as organizational forms are locally fixed (Assumption 2). Whenever these conditions do not hold, the signs of some of the effects are generally ambiguous. Hence, we report in the right column the results for our baseline calibration, which we introduce in Section 4.2.

Wages remain constant without frictions but they decline in our calibrated economy. The interest rate declines in either case, implying that the cost of capital in pass-throughs decreases. However, since the interest rate decline is not large enough to fully offset the mechanical effect of higher corporate taxes, the cost of capital in C corporations increases. Therefore, the compensation of the residual claimants, the owner-managers, increases in pass-throughs but decreases in C corporations. Aggregate income is not

Effect of an increase in $\tau_{\tilde{c}}$ on ...	Frictionless	Baseline
Factor prices (Proposition 1)		
workers' wage	0	$-$
interest rate	$-$	$-$
Managerial compensation (Proposition 2)		
in unconstr. pass-throughs	$+$	$+$
in C corporations	$-$	$-$
in constr. pass-throughs	n/a	$+$
Aggregate gross income (Proposition 3)	0	$-$
Revenue (Proposition 4)	$+$	$+$

Table 1: Summary of Directional Changes: This table summarizes whether the respective equilibrium variable increases ($+$), decreases ($-$) or stays the same (0) in response to an increase in the effective corporate tax rate $\tau_{\tilde{c}}$. The frictionless benchmark corresponds to the case where $\omega = \mu = \kappa = 0$ and Assumption 2 holds, the baseline to our calibrated economy of Section 4.2.

affected in the frictionless benchmark but declines in the environment with frictions. Finally, revenue increases in either case, even though with frictions the direct positive effect is partially offset due to a strictly positive deadweight loss.

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.[18]

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,*

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

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.

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, or as Harberger puts it: "[c]apitalists as a group lose in income earned an aggregate amount equal to the amount received by the government" Harberger (1962, p. 219).

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

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

[18] 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.

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. As discussed above, we cannot analytically sign some of the key elasticities, and rely on a calibrated numerical exercise for the rest of paper.

Following Auerbach (2018)'s estimate for the U.S., 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. 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. Matching the small number and large average size of C corporations requires both a positive fixed incorporation cost ($\kappa = 1.679$) and a positive equity issuance cost ($\mu = 0.598$).[19] 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 first best allocation; i.e., when $\omega = \mu = \kappa = 0$ and all other parameters are unchanged. In the first best, 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.

Relative to the first best, there are some significant differences in the choice of occupation and organizational form in the presence of financial and tax frictions. Some agents, who would choose to form a C corporation in the first best, given the higher funding

[19] With $r = 0.071$ and $\lambda = 0.405$, the equity issuance cost increases the marginal cost of C corporations by $r \cdot \lambda \cdot \mu = 1.71\%$.

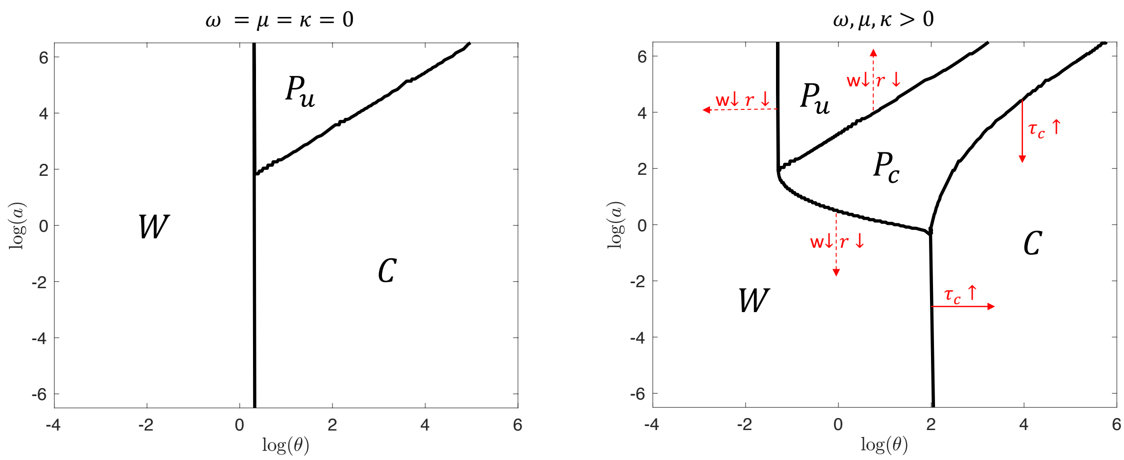

Figure 5: Occupation and Organizational Forms

The left (right) panel displays the choice of occupation and organizational form in the absence (presence) of financial frictions and a wedge between the taxes on corporate- and personal income. Mean labor productivity ν is assumed.

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). In the first best, these firms would be unconstrained pass-throughs (operating at a smaller scale) or C corporations (operating at a larger scale). Moreover, 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.

Our model generates three clear selection patterns into entrepreneurship. First, a higher managerial productivity θ increases the probability of becoming an entrepreneur. While managerial productivity is, of course, not directly observable, recent papers by Bhandari et al. (2022) and Indraccolo and Piosk (2023), using administrative and longitudinal data from the U.S. and Denmark, respectively, establish empirically that accumulated managerial (entrepreneurial) skills are key determinants both for entering entrepreneurship and for becoming a successful entrepreneur. Second, higher wealth also increases the probability of becoming an entrepreneur. This is well-established empirically in the literature. For example, Evans and Jovanovic (1989) and Buera (2009) estimate structural models of entrepreneurship and find evidence for the presence of borrowing constraints. Third, in our model, given entrepreneurial ability θ, lower wealth individuals are more likely to organize their firm as a C corporation rather than as a pass-through. To the best of our knowledge—likely due to the very low prevalence of owner-managers of C corporations in US survey data—there is no existing evidence on how US business founders' wealth impacted their choice of organizational form at the time of entry. However, using administrative US tax data Smith et al. (2023) document that at least for the whole cross-section of the population, the above pattern is consistent with the data in the sense that pass-through wealth is indeed particularly prevalent at the top of the wealth distribution. For example, according to their estimates the richest 1% (0.1%) of US citizens own about two thirds (more than one third) of total US pass-through wealth but 'only' 33.7% (15.7%) of total US wealth.

In the following, we first quantify the effects of a marginal increase in the tax rate on corporate profits, and then show to translate the results to arbitrary tax changes with an application to the TCJA. 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

$$\tilde{\eta}_{q,\omega} = \frac{\lambda}{1 + \lambda(\omega + \mu)} = 0.32;$$

i.e., a one percentage point increase in the tax rate on corporate profits increases the cost of capital by 0.32 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 capital productivity, reduces labor productivity. Thus, both the 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.

Total Response	Intensive Margin	Extensive Margin			
		$\overrightarrow{CP_c}$	$\overrightarrow{CW}$	$\overrightarrow{WP_c}$	$\overrightarrow{WP_u}$
Wage					
-0.021	-0.032	-0.008	-0.014	0.024	0.010
100.0%	155.8%	40.8%	68.0%	-118.0%	-46.6%
Interest rate					
-0.202	-0.274	-0.021	-0.012	0.036	0.069
100.0%	135.2%	10.4%	5.9%	-17.7%	-33.9%

Table 2: Semi-elasticities of factor prices to corporate tax increase

Table 2 reports this decomposition. A one percentage point increase in the corporate tax reduces the wage rate by 0.021%. The increase in misallocation of production factors along the intensive margin decreases the wage by 0.032%. The various extensive margin effects are relatively sizable as well. However, they have different signs, as some C corporation owners downsize and start as constrained pass-through or 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 smaller, and on net mitigates the wage impact.

Furthermore, the interest rate falls by 0.20%, which is driven by the reallocation of production factors along the intensive margin. 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 reduces gross income ($\tilde{Y}$) slightly by 0.002%, suggesting that misallocation is small. However, as Table 3 shows, building on Proposition 3, this small value is the result of larger offsetting effects: while output Y decreases by 0.083%, the flow away from C corporations triggers an almost completely offsetting reduction in incorporation (-0.011%) and equity issuance costs (-0.070%). While net misallocation is small, misallocation in terms of gross output Y is substantial. This distinction is important because it is the latter that matters for the wage and interest rate response.

Total Response	Output (Y)	Incorporation (κC)	Equity issuance ($\mu r E^o$)
-0.002	-0.083	0.011	0.070

Table 3: Semi-elasticity of gross income to corporate tax increase

Tax Revenue Response. Following Proposition 4, Table 4 decomposes the total response of tax revenue (0.163%) into a mechanical increase in revenue associated with a one percentage point higher tax on corporate profits of 0.180%, a behavioral effect capturing the reallocation of income across tax bases (-0.015%), as well as a reduction in total income resulting from increased misallocation (-0.002%). Thus, combining the latter two effects, tax revenue increases by 10.3% less than the direct effect.

Total Response	Mechanical	Behavioral	Misallocation
0.163	0.180	-0.015	-0.002
100.0%	110.3%	-9.0%	-1.3%

Table 4: Semi-elasticity of tax revenue to corporate tax increase

Aggregate Net Income Response. Aggregate net income declines by 0.05%, reflecting the changes in gross income and tax revenue.

Tax Incidence by Production Factor. We proceed to disaggregate the incidence of the corporate tax. The upper panel of Table 5 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 0.20%. 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 87.9%. Hence, we find that in our calibrated economy with financial frictions and a positive tax wedge, the incidence on capital is close to the benchmark of a 100%, which obtains in the first best (Corollary 2).

However, contrary to the case without misallocation prior to the tax increase, we find a large incidence on labor of 81.8%, offset by a -69.7% incidence on management: for every dollar of aggregate net income lost in response to the tax hike, managers gain 70 cents on net. Even though the tax hike increases the cost of capital for C corporations, reducing their managers' net income, this direct effect is more than offset in equilibrium by the fall in wages and interest rates. The latter 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)).

By production factor:	Capital	Labor	Management	
	0.879	0.818	-0.697	
By initial occupation:	Workers	C-corp. owners	P_c owners	P_u owners
Aggregate incidence	0.760	0.563	-0.287	-0.036
Population share	0.922	0.004	0.058	0.017
Per capita incidence	0.824	137.341	-4.988	-2.156

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

Tax Incidence by Occupation. That the burden of the tax increase is not born uniformly is also apparent in the lower panel of Table 5: The owners of C corporations lose 56 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. Workers' overall net income declines by 76 cents for every dollar of aggregate net income loss.[20]

Per capita, income changes are larger for entrepreneurs, who constitute a small fraction of the 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 $137 for each C corporation owner, while constrained pass-through owners gain $5.0 and unconstrained pass-through owners gain $2.2. Yet, even on a per capita basis, the average worker loses $0.82 per dollar of aggregate net income loss—that is, the average worker is almost as negatively affected by the tax hike as the average individual in the economy.

Distributional Impact of the TCJA. We apply our findings to study the long-term distributional impact of the TCJA. While there is a range of estimates for the effective decline in the corporate tax rate, the left panel of Figure 6 shows that in our model the tax incidence is almost constant as a function of the size of the tax change—in other words, the effects are close to linear in the size of the tax change.[21] The incidence on labor increases slightly for larger tax hikes, as misallocation is magnified; however, this variation is quantitatively small. The right panel of Figure 6 displays the model prediction for the long-run impact of the TCJA across the income distribution, which we quantify as a 3 p.p. reduction in the effective corporate tax rate.[22] On average, net income in all income brackets increases in response to the tax cut.[23] The relative net income change increases monotonically from +0.078% for the bottom income quintile to 0.098% for P60-80. The P80-90 income group benefits slightly less (+0.071%), while the top 10% gain the most (+0.178%). Since the incidence on labor and capital is similar, these distributional differences reflect primarily different occupational- and organizational choice across the income distribution, in particular the relative prevalence of C corporations vs. pass-throughs. While aggregate net managerial income falls in response to the tax cut (the incidence on management is overall negative), the owners of C corporations benefit disproportionally from the tax cut as explained previously when discussing Table 5, and pass-through owners suffer income losses. Pass-through

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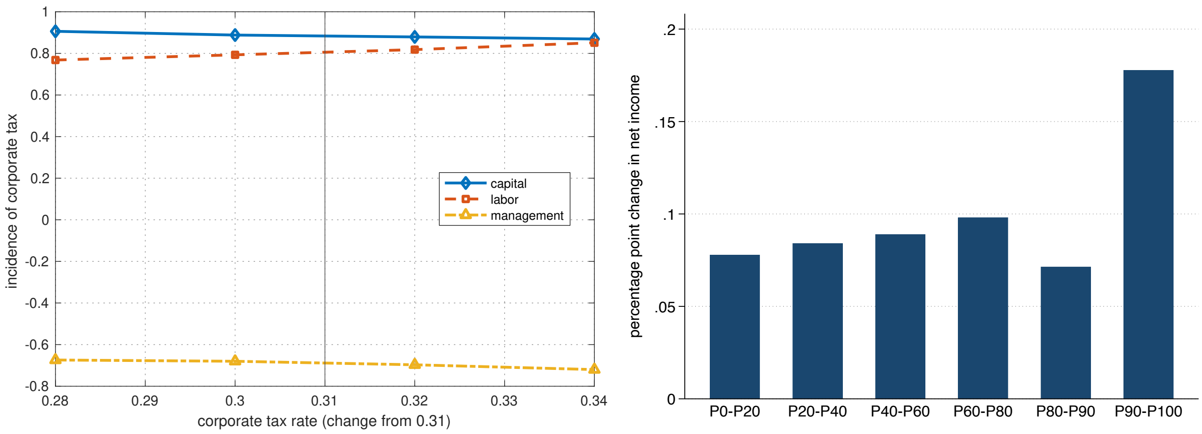
[20] The incidence on workers is slightly below the one on labor and capital because it refers to the set of agents that are workers in the initial equilibrium. Some of them switch to being pass-through entrepreneurs, and these switchers are less negatively affected by the tax hike.

[21] Observe that our static model does therefore not generate significant asymmetries of tax increases vs. decreases. Fuest et al. (2018) and Benzarti et al. (2020) document such asymmetries empirically for changes in local business-, respectively value added taxes. In a dynamic framework asymmetries may arise from policy uncertainy, e.g. from agents' asymmetric anticipation with regards to the duration of tax cuts vs. hikes (see Ábrahám et al., 2023).

[22] The TCJA reduced the statutory corporate tax rate from 35% to 21%. The reduction in the effective tax rate on corporate profits is estimated to be lower due to various deductions, credits, and income deferral strategies. Dyreng et al. (2023) estimate a contemporaneous decline in the effective rate of 7–12 p.p., which includes the effect of transitory provisions. The Penn Wharton Budget Model estimates that after provisions expire in 2027, the effective rate decreases by 3 p.p. (https://budgetmodel.wharton.upenn.edu/issues/2017/12/15/effective-tax-rates-by-industry). We focus our analysis on the latter, long-run, estimate.

[23] Since this tax reform is not revenue-neutral, the fact that all income brackets' net income increases in response to the tax cut should not be interpreted as indicating a Pareto improvement.

owners are skewed towards the top 20% of the income distribution, explaining the smaller gain for P80-90. However, C corporations are clustered disproportionally at the very top of the income distribution, explaining the largest gains for the top 10%. This is because our model replicates the prevalence and average size of each type of firm; in particular, the property that while C corporations account for only 5% of all businesses, their income share is above 40%. We conclude that even though a substantial fraction of the corporate tax incidence falls on labor, the top 10% are the biggest beneficiaries of the corporate tax cut.



(a) Corporate Tax Incidence: Linearity

(b) Net Income Change by Income Percentile

Figure 6: Distributional Impact of TCJA Corporate Tax Cut

The left panel displays the incidence of the corporate tax on the production factors as a function of the size of the tax change (from $\tau_{\tilde{c}} = 0.31$ to the value on the x-axis). The right panel displays the equilibrium change in post-tax income, by initial income percentile, in response to a decrease in the effective corporate tax from 0.31 to 0.28, as estimated for the long-run impact of the TCJA.

Robustness of Quantitative Results. We quantify the robustness of our numerical findings along two dimensions in Appendix C.3. First, our baseline model calibration exogenously imposes a positive correlation between wealth and abilities, matching the correlation between wealth and realized income in the SCF (around 0.3). One limitation of our static setup is that the choice of correlation structure is not obvious, since the correlation in the data arises endogenously and dynamically. We show that if instead we were to assume no correlation between wealth and abilities, the incidence on labor would be slightly larger (increase from 0.82 to 0.90). Second, our baseline model abstracts from endogenous labor supply. We find that across a variety of specifications, featuring various kinds of substitution and income effects in labor supply, and given empirically reasonable Frisch elasticities of labor supply ranging from around one third to one half, the incidence on labor decreases slightly (to 0.71, respectively

0.62).[24]

Comparison to Income Tax Increase. It is instructive to contrast the incidence of the corporate tax to the one of the personal income tax τ_i in our framework. As Table 6 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. The effective incidence of the income tax is close to the statutory incidence: the burden is roughly shared in the way it would be if agents' behavior was not affected by the tax increase. While the increase in 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.

By production factor:	Capital	Labor	Management
	0.250	0.644	0.106

Table 6: Incidence of income tax

5 Uncertainty

For reasons of tractability we focused our analysis on a deterministic environment. Given the evidence on substantial riskiness of business income, in particular the one of pass-through business owners (DeBacker et al., 2023), in this section we briefly outline how our analysis is affected when instead production is subject to shocks. More details can be found in Appendix F.

Technology and Financial Frictions. We model uncertainty by assuming that managerial productivity m is now stochastic. Otherwise, each agent has access to the same technology $F(k, l, m)$. In particular, now $m = \theta$ only with probability p - the entrepreneur is successful - while $m = 0$ with the remaining probability $1 - p$, in which case the entrepreneur is unable to produce any output. The key assumption is that m is not known when the key entrepreneurial choices (occupation, legal form and investment) are made, i.e. all these decisions are made under uncertainty. The same collateral constraint must hold as in the benchmark without uncertainty (see equation (1)). We also assume that the firm has enough resources to fully repay its debt, including

[24] In Appendix E we study analytically the case with endogenous labor supply. Tractability requires additional assumptions, in particular locally fixed occupations and organizational forms (Assumption 2). First, we consider the case where only workers, but not entrepreneurs, adjust their labor supply. In this case, the effect of corporate tax increases on wages is weakened, relative to our exogenous labor supply benchmark, when income effects are precluded (Proposition E.1, Part 1). With income effects, the effect on wages may be stronger or weaker, depending on whether the income or the substitution effect dominates (Proposition E.1, Part 2). When entrepreneurs adjust their effort as well, the effect on wages is ambiguous even without income effects (Proposition E.2).

interest, even in the event the entrepreneur is not successful, that is:[25]

$$\frac{\lambda}{1-\lambda} > r.$$

As a consequence firms never default and the (before tax) return on debt is still riskless and equal to r.

Labor demand is instead chosen after the shock realises. Hence, entrepreneurs hire workers only when they are successful. This implies that, as in the benchmark, the marginal product of labour is equated to wages for all types of firms (see equation (3)).

Pass-Throughs. In the event of failure the pass-through entrepreneur can only consume what is left of her assets after paying the interest due on the firm debt:

$$c^{P,F}(a,k,\theta) = -(1-\tau_i)r(k-a) + a. \tag{14}$$

At the same time, her consumption in the success state is determined in the same way as in the benchmark (see equation (see equation (4)). This implies that the optimality condition with respect to capital for unconstrained pass-throughs is given by

$$F_k(k,l(k,\theta),\theta) = r\left(1 + \frac{1-p}{p}\frac{u'(c^{P,F}(a,k,\theta))}{u'(c^{P,S}(a,k,\theta))}\right). \tag{15}$$

For the (poorer) financially constrained entrepreneurs running a pass-through we have $k = \frac{a}{\lambda}$, as before.

Observe that when agents are risk neutral the above optimality condition (15) simplifies to $F_k(k,l(k,\theta),\theta) = \frac{r}{p} > r$. The possibility of failure reduces the return of investment and thus the optimal capital stock, relative to the case without risk. With risk aversion, the reduction in investment is even bigger, since $\frac{u'(c^{P,F}(a,k,\theta))}{u'(c^{P,S}(a,k,\theta))} > 1$: The entrepreneur faces consumption risk and the only way to reduce this risk is to invest less of her wealth in her risky business and more in the riskless asset (the diversified portfolio of all firms' debt and equity).

C corporations. Compared to pass-through owners, C corporation owners are able to attain a higher level of hedging against failure by issuing external equity to fund their investment, thus shielding away more of their own assets. Of course, using external equity is more costly for the reasons outlined in the baseline model, the presence of issuance costs and the tax wedge. We focus our attention here on the case where equity issuance and firms' incorporation costs are both zero ($\mu = \kappa = 0$) and assume that, when output is zero (in the event of failure), no managerial compensation can be paid to the entrepreneur. This allows us to obtain analytically tractable results while still capturing the main qualitative effects of the tax wedge under production risk. Absent equity issuance costs, the entrepreneur will only use outside equity, to exploit

[25] Note that this condition is satisfied also in the calibration of the baseline environment without risk.

its hedging benefit, and no inside equity ($e^i = 0$). Furthermore the tax advantage of debt still implies (as in the benchmark) that the firm issues as much debt as possible, i.e. the collateral constraint binds, $k = \frac{e^o}{\lambda}$. The first order condition for investment in C corporations is thus given by

$$F_k(k, l(k, \theta), \theta) = \frac{r}{p}(1 + \lambda\omega). \tag{16}$$

Observe that, contrary to the case of an unconstrained pass-through, this condition is independent of the entrepreneur's risk aversion as well as of her wealth. The reason for this is that her consumption in the failure state is equal to the full return on wealth, $(1 - \tau_i)ra + a$, and her managerial compensation in the failure state is zero, independent of the level of investment. Thus, the entrepreneur only faces the upside risk in running the firm, implying that the firm's investment is chosen in order to maximize managerial compensation in the good state. Therefore, as in our baseline model without risk, all C corporations will have the same marginal product of capital. Also, the excess cost of equity (here solely in terms of taxes) results in a lower than socially optimal level of investment for C corporations.

Optimal Organizational Form. Thus, on top of being able to attain greater funding, in the presence of uncertainty another benefit of C corporations' ability to issue outside equity is that it reduces the owner-managers' exposure to risk. On the cost side, as before, there is a tax disadvantage of equity. The choice between the two organizational forms then depends on the relative strength of these forces, which in turn depends on the entrepreneur's risk aversion. Assuming that their preferences exhibit a constant coefficient of relative risk aversion equal to one (log utility), we show in Appendix F that Figure 8 below characterizes the choice of organizational form and associated pattern of the investment level if

$$\frac{\alpha_k}{\alpha_k + \alpha_m} \geq \frac{(1 - \tau_i)r}{\lambda - (1 - \lambda)(1 - \tau_i)r} \frac{1 + \lambda\omega}{\lambda\omega} \frac{1 - p}{p}. \tag{17}$$

This figure is remarkably similar to the analogous one for the benchmark case with out risk (see Figure 2): for any given θ, high wealth entrepreneurs operate firms as unconstrained pass-throughs while low wealth entrepreneurs run C-corporations. Also, the former feature a larger scale (have a lower marginal productivity of investment) than the latter (whose size is independent of wealth). The only qualitative difference between the two figures is that, with risk, the size of unconstrained pass-throughs increases with their owner's wealth, for the reasons explained above, while it is constant without risk.[26]

As in the case without risk, all unconstrained pass-throughs face a lower cost of capital,

[26] The other possible difference is that, for some parameter values, there are no constrained pass-throughs, only C corporation and unconstrained pass-throughs. However, the latter are always larger.

but the same cost of labour, as C corporations. Recall that this property was the key to establish the positive incidence of corporate taxation on labor in the benchmark model, since it implies that C corporations employ more labour per unit of capital. Hence any reallocation of capital and labour towards unconstrained pass-through results in a drop in wages. On this basis we can say that the model with production risk generates results with respect to the incidence of corporates taxes on labor that are analogous to the ones derived for the benchmark.

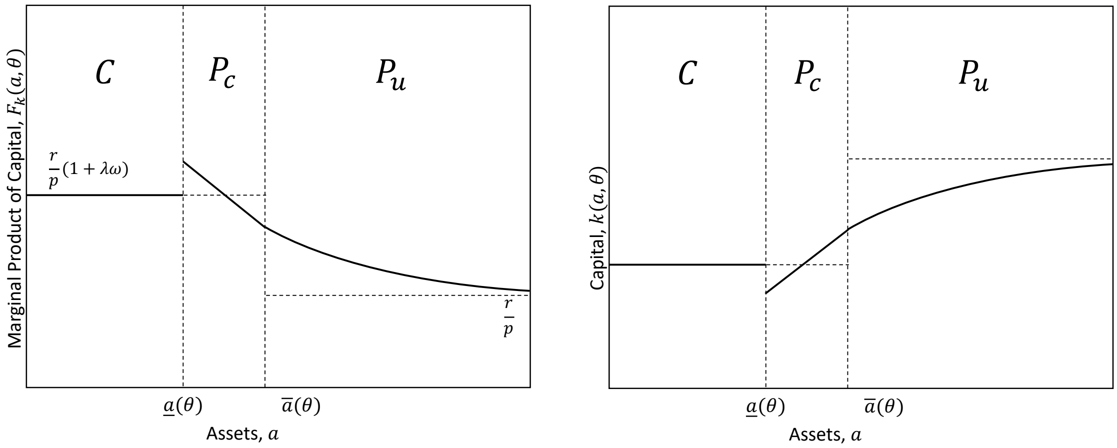


Figure 8: Capital demand as a function of a (given θ)

Note that Condition (17) is only a sufficient condition for this result, since it guarantees that *all* unconstrained pass-throughs are producing with lower marginal product of capital than C corporations. Even if this property does not hold but the majority of pass-throughs are larger than C corporations with the same θ, we would still expect positive incidence of the tax on workers. Second, note that condition (17) is more likely to be satisfied the more severe financial frictions and the tax wedge are (the higher is $\lambda\omega$) or the lower is probability of failure (the higher is p), since both features make running a pass-through more attractive.[27] Finally, the above derivations have been obtained under the (conservative) assumption that $\mu = 0$. The conclusions are strengthened if $\mu > 0$, since a positive linear issuance cost μ increases the marginal cost of funds for C corporations, which would weaken condition (17) and lead to more incidence on workers.

6 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

[27] With the values for the parameters and r as in our baseline calibration condition (17) is satisfied when $p \geq 87.7\%$.

income, and (iii) government revenue. Contrary to the standard result in the literature (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. More specifically, our model conforms with the "traditional view" in Public Finance, according to which the marginal investment of C corporations is financed by new equity issuances (Feldstein, 1970; Poterba and Summers, 1983). While this feature describes firms in the earlier stages of their life-cycle, mature firms are 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 should be interpreted as the ones occurring in the long-run, with all (potential) business owners basing 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. This tends to magnify the share of the corporate tax incidence borne by labor (Feldstein, 1974). In this sense, we view our estimates on the share of the tax burden born by labor as conservative. 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

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

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 $\{k_C(\theta), k_{P_u}(\theta), l_C(\theta), l_{P_u}(\theta), \{l_{P_c}(a,\theta)\}_{a\in(\underline{a}(\theta),\lambda k_{P_u}(\theta))}, \underline{a}(\theta), \{\tilde{v}(a,\theta)\}_{a\in[0,\lambda k_{P_u}(\theta))}, \tilde{v}_{P_u}(\theta)\}_{\theta\in[0,\infty)}$, 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, $\tilde{v}(a,\theta)$ 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 $\tilde{v}_{P_u}(\theta)$ 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 $\theta \in [0,\infty)$

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

the market clearing conditions for capital

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

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,

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

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 $\theta \in [0,\infty)$

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

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

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

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

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

which if plugged in above gives

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This is the same as

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

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

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

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

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

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

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

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

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

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

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

which is equivalent to

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

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,

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

The effective wage of the entrepreneur is implicitly given by

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

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

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

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

□

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]

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\begin{aligned}\frac{d\tilde{Y}}{d\omega} =& \frac{dY}{d\omega} + cost_{\overrightarrow{CP_c},\overrightarrow{CW}} - \Bigg(\underbrace{\mu r \lambda \eta_{k_C,\omega} K_C + \mu \frac{dr}{d\omega}[\lambda K_C - \bar{a}_C C]}_{=\frac{dEIC_{CC}}{d\omega}} \Bigg) \\ =& r\lambda(\omega+\mu)\frac{dK_C}{d\omega} \underbrace{-cost_{\overrightarrow{CP_c},\overrightarrow{CW}} + cost_{\overrightarrow{CP_c},\overrightarrow{CW}}}_{=0} - \frac{dEIC_{CC}}{d\omega}\end{aligned}$$

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 of the Calibration and Sensitivity Analysis

This section contains details on the calibration of the baseline model as well as some robustness exercises.

C.1 Ex-ante calibrated parameters

We begin by describing the exogenously set parameters. We use the effective tax rates reported by Auerbach (2018): 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 (combining effective corporate and dividend tax). This implies a tax wedge of $\omega = 0.058$.

Marginal distribution of working ability (ν): The marginal distributions for working (ν) and entrepreneurial (θ) abilities are assumed to follow, respectively, a log-normal distribution combined with a Pareto tail for the top 10% to account for the fact that while the log-normal provides a good fit for the bulk of the implied income distribution, it misses the far right tail.[C.1]

Formally, e.g. for ν, let ν_{Normal} denote an underlying latent random variable that is normally distributed, $\nu_{Normal} \sim N(\mu_\nu, \sigma_\nu)$, with associated CDF $F_{Normal}(\cdot; \mu_\nu, \sigma_\nu)$. Let $F_{Pareto}(\cdot; c_\nu, \alpha_\nu)$ denote the Pareto CDF with lower bound c_ν and shape parameter α_ν, and let $F^{-1}_{Pareto}(\cdot; c_\nu, \alpha_\nu) : [0,1] \to [c_\nu, \infty)$ denote the corresponding inverse CDF.

Then we assume that the latent ability ν_{Normal} is transformed into effective labor efficiency units ν according to the mapping $\nu = g(\nu_{Normal})$, where

$$g(\nu_{Normal}) = \begin{cases} \exp(\nu_{Normal}) & \text{if } F_{Normal}(\nu_{Normal}; \mu_\nu, \sigma_\nu) \leq 0.9, \\ F^{-1}_{Pareto}\left(\frac{F_{Normal}(\nu_{Normal}; \mu_\nu, \sigma_\nu) - 0.9}{1-0.9}; c_\nu, \alpha_\nu\right) & \text{if } F_{Normal}(\nu_{Normal}; \mu_\nu, \sigma_\nu) > 0.9 \end{cases} \tag{C.1}$$

Here, the level parameter is a normalization ($\mu_\nu = 0$), and c_ν is chosen residually such that the distribution is continuous at the cut-off quantile; i.e., $c_\nu = \exp\left(F^{-1}_{Normal}(0.9; \mu_\nu, \sigma_\nu)\right)$. The two dispersion parameters ($\sigma_\nu = 0.7, \alpha_\nu = 1.54$) are calibrated to fit moments of the labor income distribution—as the upper panel of Table 7 reveals, this specification provides a good fit.

Marginal distribution of entrepreneurial ability (θ): For θ, we employ the same specification. Again, μ_θ and c_θ are normalizations. As for the two dispersion parameters ($\sigma_\theta, \alpha_\theta$), setting the tail parameter to $\alpha_\theta = 1.4$ provides a good approximation to the right tail of the entrepreneurial income distribution as the lower panel of Table 7 shows. We explain below how the standard deviation of entrepreneurial ability σ_θ is internally calibrated, jointly with other model parameters, via the simulated method of moments to match a set of data moments.

Marginal distribution of wealth (a): For wealth, we also assume a log-normal distribution in combination with a Pareto tail for the top 10%, as above. In addition, we assume a mass point

[C.1] This specification is also used, e.g., in Hubmer et al. (2021).

	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	0.164	0.608	0.471	0.193	0.078	0.029
Entrepreneurs:						
Data (SCF 2019)	0.111	0.704	0.575	0.238	0.070	0.020
Model	0.171	0.580	0.443	0.184	0.075	0.027

Table 7: Income shares

at zero wealth of 10.8%, equal to the fraction of households with zero or negative net wealth in U.S. data (SCF 2019). The standard deviation of the log-normal component ($\sigma_a = 2.25$) and the tail coefficient ($\alpha_a = 1.55$) are chosen to match the wealth shares displayed in Table 8.

Wealth shares:	bottom 50%	top 10%	top 1%	top 0.1%	top 0.01%	Avg. entrepreneur vs. worker wealth
Data (SCF 2019)	0.008	0.784	0.394	0.141	0.055	7.37
Model	0.008	0.790	0.344	0.147	0.060	6.91

Table 8: Wealth distribution

Correlation between abilities and wealth: We set the correlation between working and entrepreneurial ability to 0.15 following Allub and Erosa (2019), $corr_{\eta,\nu} = 0.15$.

In a dynamic model, wealth and abilities would be endogenously correlated in the stationary equilibrium. Moreover, the data (SCF) shows a positive correlation between realized labor income and wealth (0.305), and an even stronger positive correlation between realized entrepreneurial income and wealth (0.595). It is not obvious how to translate these correlations into our static setup. We assume that labor productivity ν and wealth exhibits the correlation between labor income and wealth in the SCF data (0.305). Since most agents are workers, the implied correlation between realized labor income and wealth in equilibrium is very similar (0.316).

Setting an appropriate correlation between wealth and entrepreneurial ability is more challenging since we only observed realized entrepreneurial income in the data, and, furthermore, entrepreneurs constitute a small fraction of the population. Thus, we observe only a heavily selected sample. We proceed as follows: For our baseline calibration, we simply assume that the correlation between entrepreneurial ability (θ) and wealth is the same as the one between ν and wealth (0.305). It turns out that with this parameterization, the model endogenously reproduces the fact that entrepreneurs are on average many times richer than workers: in the SCF data, the average entrepreneur is 7.37 times as rich as the average worker. In our baseline model, the average entrepreneur is 6.91 times as rich as the average worker. The fit of this non-targeted moment is reassuring for the selection into entrepreneurship as a function of wealth. To assess robustness, in Appendix C.3.1 we also report the results from an alternative calibration where wealth and abilities are uncorrelated. We find that our main results are only moderately affected.[C.2]

C.2 Internally calibrated parameters

We calibrate the remaining six parameters to match six data moments via the simulated method of moments. Table 9 summarizes the calibrated parameters and Table 10 displays the fit of the targeted moments. We minimize the sum of squared relative errors. I.e., for data moments m_i^D and model moments m_i^M, $i = 1, 2, ...6$, the parameters $\xi^* \in \mathbb{R}^6$ are chosen such that

$$\xi^* = \arg\min_{\xi \in \mathbb{R}^6} \left\{ \sum_{i=1}^{6} \left(\frac{m_i^M(\xi) - m_i^D}{m_i^D} \right)^2 \right\}. \tag{C.2}$$

Parameter	Description	Value
α_m	elasticity of output to managerial input	0.056
α_l	elasticity of output to labor input	0.630
σ_θ	variance of entrepreneurial ability	0.538
κ	fixed cost of running a C corporation	1.679
μ	equity issuance cost	0.598
λ	equity requirement	0.405

Table 9: Calibrated parameters

Moment	Data	Model
Share of total income earned by owners of pass-throughs (PT)	0.208	0.151
Capital income earned by non-PT owners as fraction of aggregate income	0.140	0.176
Share of PT entrepreneurs	0.066	0.074
Fraction of C corporations among all businesses	0.050	0.052
Income share of C corporations among all businesses	0.440	0.420
Aggregate debt-output ratio	2.160	2.114

Table 10: Calibration targets

While the parameters jointly affect all moments, we now provide some intuition into which moment is particularly informative for each parameter, and we also describe how we chose the data targets.

First, the income shares are computed in the 2019 edition of the SCF, where we define ownership of a pass-through business (PT) as those individuals who report to have an active management

[C.2] To implement the three-dimensional correlation structure numerically, we use a multivariate normal copula distribution. We discretize the distribution with one hundred grid points in each dimension, and put relatively more points in the thick right tails.

interest in a PT and who own a strictly positive amount of its shares. We then partition aggregate income into (i) total income of PT owners, (ii) labor income of non-PT owners, (iii) capital income of non-PT owners. The production elasticities ($\alpha^m, \alpha^k, \alpha^l$) are particularly informative about these. Since both income shares and production elasticities sum to one, one of them is, respectively, redundant. The variance of entrepreneurial activity is informative about the fraction of PT entrepreneurs (relative to the income share of PT owners).

Second, the fraction of C corporations among all businesses (5%) as well as the income share of C corporations (44%) are borrowed from Auerbach (2018). The fixed cost of running a C corporation is particularly informative about the former, while the equity issuance cost is particularly informative about the latter moment. Finally, we target an aggregate debt-to-output ratio of 2.16.[C.3] The equity requirement λ is particularly informative about this moment.

C.3 Sensitivity of Model Results

We quantify the sensitivity of our baseline model findings along two dimensions, the correlation between wealth and abilities, and when allowing for endogenous labor supply.[C.4]

C.3.1 Correlation Wealth–Ability

First, as discussed above, generating an appropriate correlation between abilities and wealth is not obvious in a static model. While the baseline assumes a positive correlation, column (2) in Table 11 below shows that the incidence of the corporate tax on labor increases from 0.82 to 0.90 when assuming instead zero correlation between wealth and either of the abilities, whereas the incidence on capital decreases from 0.88 to 0.69. The incidence by occupation reflects this moderate shift towards labor as the incidence on workers increases from 0.76 to 0.82. Thus, we find that a stronger correlation between wealth and abilities loads a slightly smaller fraction of the incidence of the corporate tax on labor and on workers, as misallocation decreases.

C.3.2 Endogenous Labor Supply

Second, the baseline model abstracts from endogenous labor supply. Here, we report results from two re-calibrated economies with endogenous labor supply. In each case, we assume symmetric preferences for workers and entrepreneurs over consumption c and hours worked n. For workers, effective units of labor supply are then νn, whereas for entrepreneurs the effective managerial input equals θn. In the first alternative specification, column (3a) in Table 11, we allow for substitution effects in labor supply but rule out income effects as in Proposition E.2. In particular, we consider the case where both workers' and entrepreneurs' labor supply is characterized by a mid-range Frisch elasticity of $1/3$. In the second alternative specification, column (3b) in Table 11, we employ more general preferences over c and n that also allow for income effects:

[C.3] According to the World Bank, the ratio of domestic credit to private sector output equals 216% in the U.S. in 2021 (`https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS`). This calibration strategy is also used, e.g., in Moll (2014).

[C.4] For these exercises, we always re-calibrate the model economy.

	Baseline	No Correlation	Endogenous Labor Supply	
			GHH preferences	+income effect
By production factor:	(1)	(2)	(3a)	(3b)
Capital	0.879	0.690	0.681	1.307
Labor	0.818	0.903	0.705	0.619
Management	-0.697	-0.594	-0.386	-0.926
By occupation:				
Workers	0.760	0.820	0.617	0.813
C-corp. owners	0.563	0.516	0.636	0.499
Constrained PT owners	-0.287	-0.286	-0.180	-0.346
Unconstrained PT owners	-0.036	-0.049	-0.073	0.034

Table 11: Incidence of Corporate Tax in Alternative Model Versions

$$u(c,n) = \frac{c^{1-\gamma}}{1-\gamma} - \frac{n^{1+1/\chi}}{1+1/\chi}. \tag{C.3}$$

With these preferences, the wage-elasticity of labor supply of agents without wealth can be expressed in closed form as $\frac{1-\gamma}{\gamma+\frac{1}{\chi}}$. With $\gamma > 1$ ($\gamma < 1$), the income effect (substitution effect) dominates and agents reduce (increase) their labor supply in response to a wage increase. In the knife-edge case where utility is log in consumption ($\gamma = 1$), labor supply should be unaffected. We pick $\gamma = 2$, which is in the middle of the range $\gamma \in (1,3)$ employed in most of the quantitative macroeconomics literature. We further pick a Frisch elasticity of $\chi = 0.53$, the upper bound of the range of estimates employed by the Congressional Budget Office (Reichling and Whalen, 2012).

As Table 11 shows, the incidence on labor as a production factor and on workers as an occupation is relatively robust along this dimension, ranging from 0.62–0.71 (vs. 0.82 in the baseline), respectively 0.62–0.82 (vs. 0.76 in the baseline). These results suggest that typical parametrizations of endogenous labor supply do not substantially affect our main quantitative finding, that the incidence of the corporate tax falls to a large extent on workers.

D Relation to Harberger (1962)

In this Appendix we explain in a bit more detail how our analysis is related to the seminal paper of Harberger (1962). While our model is in various dimensions more general than his, we first would like to remind the reader of the single dimension in which it is more restrictive: While we assume that all firms produce the same good using the same technology, Harberger (1962) assumes that consumers have preferences over two differentiated goods, one produced only by firms that are subject to the corporate tax (C corporations), the other one only produced by firms that are not (pass-throughs) and the technologies used by the respective firm types might differ. In fact, this generalization is the only reason why in Harberger (1962) the incidence on capital (labor) may in theory differ from being exactly equal to 100% (0%).[D.1] However, as we mentioned in the introduction, in his numerical calibrations this consideration turns out to be quantitatively small and consequently, he finds that "[i]t is hard to avoid the conclusion that plausible alternative sets of assumptions [...] all yield results in which capital bears very close to 100 per cent of the tax burden" (p. 234). Our framework thus nests a version of the Harberger model, where the two goods are perfect substitutes and produced with the same technology. In the following we refer to this framework loosely as the "stylized Harberger model". This stylized version of his model captures the main mechanism that drives his result that (about) 100% of the incidence falls on capital.

The Stylized Harberger Model.

As in our model there are two types of firms, C corporations and pass-throughs. Both produce the single consumption good with the constant returns to scale production function

$$Y = F(K, L),$$

where K and L are the fixed production factors capital and labor. There are no entrepreneurs and workers supply their labor inelastically. The two firm types are exogenously given and cannot switch. In particular, a share $C < 1$ of firms operates as C corporation, and a share $(1 - C)$ as pass-through. There are no equity issuance costs ($\kappa = \mu = 0$). In Harberger's original formulation a marginal corporate tax is introduced into a laissez-faire environment, where initially $\tau_{\tilde{c}} = \tau_i = 0$. However, given fixed factor supply the allocation is the same when simply considering any combination of $(\tau_{\tilde{c}}, \tau_i)$ with $\tau_{\tilde{c}} = \tau_i$, that is initial income- and (total) corporate taxes can be positive as long as they are the same.

Proposition D.1. *In the stylized Harberger model we have:*

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

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

[D.1] Direction and size of eventual deviations from this benchmark (capital 100%, labor 0%) depend on the two substitution elasticities between capital and labor in production, the substitution elasticities between the two goods, the two elasticities of demand and the factor intensities of the two technologies.

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

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

3. *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*

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

4. *The incidence of corporate taxes on capital and labor are given by, respectively,*

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

Auerbach (2018) summarizes the mechanism behind the result that 100% of the incidence falls on capital – approximately in the various calibrations of Harberger (1962) but exactly in the present stylized Harberger model – as follows:

> "The underlying intuition [is] that the corporate tax causes capital to shift from the corporate sector to the noncorporate sector (consisting of all businesses not subject to the corporate tax), depressing after-tax returns equally in both sectors but [...] not shifting any of the tax burden to labor." (Auerbach (2018), p.99)

How the Stylized Harberger Model is nested in our Framework.

Observe that strictly speaking, our model collapses to the stylized Harberger model only when (i) $\omega = \mu = \kappa = 0$, (ii) both occupations and organizational forms are invariant to tax changes, and (iii) the share of management in production goes to zero, $\alpha_m \to 0$. However, all the results in Proposition D.1 are identical to those of Corollaries 1 and 2. In fact, the proofs work analogously. The reason is that already (i) and a weaker version of (ii), i.e. Assumption 2, guarantee that the classical Harberger result emerges.

Contrary to Harberger (1962) – the original as well as the stylized model – our framework has a managerial input. Hence, the Harberger framework does not feature the redistribution from managers of C corporations to those of pass-through businesses, which happens in our model. However, we show that, even with a strictly positive managerial input share $\alpha_m > 0$, the incidence on managerial income as a whole is zero (Corollary 2) because the gains of pass-through owners are exactly offset by the losses of C corporation owners. In addition, as α_m approaches zero, the mass of managers in our framework would go to zero too. While by part 2 of Corollary 1 the semi-elasticity of managerial wages in C corporation and pass-throughs approaches, respectively, minus and plus infinity, only a mass zero of agents will face these managerial wage changes.

E Endogenous Labor Supply

In this Appendix, we extend the framework by allowing for endogenous labour supply. Here, we derive analytically the factor price responses to corporate tax increases when labor supply is endogenous (the analogue of Proposition 1 in the main text). For tractability, we impose Assumption 2; i.e., we assume that occupation and organizational form are locally fixed. We first consider the case where only workers' labor supply is endogenous, before moving to the general case, where both workers and entrepreneurs decide endogenously on their labor supply (effort). In addition, in Section C.3.2 we discuss how the quantitative model findings are affected by endogenous labor supply in the general setting when allowing for the choice of occupation and organizational form.

E.1 Endogenous Labor Supply of Workers Only

Workers' utility function is now given by $u(c,n)$, where n denotes their labor supply and preferences satisfy $u_c > 0, u_{cc} < 0, u_n \leq 0$ and $u_{nn} < 0$. Thus, a worker with assets a and ability ν solves the problem

$$\max_n u\big(\underbrace{(1-\tau_i)(w\nu n + ra) + a}_{=c}, n\big).$$

The first order condition is hence given by

$$(1-\tau_i)w\nu u_c(c,n) + u_n(c,n) = 0.$$

The effective labor supply of a worker with ability ν is now given by $n\nu$ (rather than just ν).

As always, a worker's reaction to wage changes will depend on income and substitution effects. We hence consider two particular preference forms.

Proposition E.1. *Assume (locally) fixed occupations and organizational forms and let $\hat{\eta}_{w,\omega}$ and $\hat{\eta}_{r,\omega}$ be defined as in Proposition 1.*

1. ***GHH preferences.*** *Let workers have preferences that do not exhibit income effects, that is let*

$$u(c^W, n^W) = \frac{1}{1-\gamma}\left(c^W - \frac{(n^W)^{1+\frac{1}{\chi}}}{1+\frac{1}{\chi}}\right)^{1-\gamma},$$

where χ denotes the Frisch elasticity of labor supply. Then, the effect of a marginal increase in the tax wedge ω on equilibrium factor prices is given by

$$\eta_{w,\omega} = \frac{\hat{\eta}_{w,\omega}}{1+\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\chi} \qquad \text{and} \qquad \eta_{r,\omega} = -\frac{K_C}{K_C+K_{P_u}}\tilde{\eta}_{q,\omega} - \frac{\alpha_l}{1-\alpha_l}\eta_{w,\omega}.$$

2. ***Additive Separable Preferences.*** *Let workers' preferences be given by*

$$u(c^W, n^W) = \frac{(c^W)^{1-\gamma}}{1-\gamma} - \frac{(n^W)^{1+1/\chi}}{1+1/\chi},$$

and assume that all wealth is owned by entrepreneurs. Then

$$\eta_{w,\omega} = \frac{\hat{\eta}_{w,\omega}}{1 + \frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{v}\frac{1-\gamma}{\gamma+\frac{1}{\chi}}} \qquad \textit{and} \qquad \eta_{r,\omega} = \hat{\eta}_{r,\omega} + \hat{\eta}_{w,\omega}\frac{\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{v}\frac{1-\gamma}{\gamma+\frac{1}{\chi}}}{1 + \frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{v}\frac{1-\gamma}{\gamma+\frac{1}{\chi}}}\frac{\alpha_l}{1-\alpha_l},$$

where $\bar{v}$ denotes the average productivity of workers. Thus, when utility is log in consumption ($\gamma = 1$) we have

$$\eta_{w,\omega} = \hat{\eta}_{w,\omega} \qquad \textit{and} \qquad \eta_{r,\omega} = \hat{\eta}_{r,\omega}.$$

The first part of the proposition characterizes the equilibrium price responses for the special case where wealth effects are precluded (GHH preferences). In this case, a reduction in wages will only introduce a substitution effect (making leisure cheaper), which will reduce labor supply. In equilibrium, the discouraging effect on labor moderates the wage decline. However, even in this polar case the decline in wages is substantial. As a back-of-the-envelope calculation, consider our baseline calibration, in which $\frac{\alpha_k(1-\alpha_l)}{\alpha_m}$ is close to (though smaller than) 3. With a mid range Frisch elasticity of $\chi \approx 1/3$, the wage effect would be reduced by one half, relative to the exogenous labor supply benchmark. With elastic labor supply of workers but inelastic managerial input and capital, some of the incidence shifts from workers' labor to the other production factors. In particular, we now have a higher incidence on capital as

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

It should be noted that abstracting from income effects results in a lower bound of the effect of corporate taxes on wages. Specifically, consider the second part of the proposition where preferences are assumed to be additively separable and it is assumed that all wealth is held by entrepreneurs.[E.1] In this case, the response on equilibrium wages is mitigated only if the coefficient of relative risk aversion is smaller than one ($\gamma < 1$). By contrast, in the other case ($\gamma > 1$) the effect on wages is actually amplified. In the knife-edge case where $\gamma = 1$ income- and substitution effects of a wage decline on labor supply cancel out, leaving labor supply unchanged. Consequently, the equilibrium price responses are identical to those of the exogenous labor supply benchmark.

[E.1] The latter assumption is necessary for tractability. When workers have positive wealth, the reduction in the interest rate induces income- and substitution effects too. However, to the extent that most wealth is owned by entrepreneurs, these additional responses should be small.

E.2 Endogenous Labor Supply of Workers and Entrepreneurs

Next, we consider the case where both workers and entrepreneurs have the same preferences, that is where both types of agents have disutility from labor (effort). To obtain analytically tractable results we need to restrict the analysis to preferences that do not exhibit income effects.

Proposition E.2. *Assume (locally) fixed occupations and organizational forms and let $\hat{\eta}_{w,\omega}$ be defined as in Proposition 1. In addition, assume that all agents have preferences that do not exhibit income effects, that is let*

$$u(c,n) = \frac{1}{1-\gamma}\left(c - \frac{n^{1+\frac{1}{\chi}}}{1+\frac{1}{\chi}}\right)^{1-\gamma},$$

where χ denotes the Frisch elasticity of labor supply. Then, the effect of a marginal increase in the tax wedge ω on equilibrium factor prices is given by

$$\eta_{w,\omega} = \frac{\hat{\eta}_{w,\omega}}{1 + \frac{\alpha_k(1-\alpha_l)}{\alpha_m}\chi - \frac{\chi}{1+\chi}\frac{1+\chi\alpha_k-\alpha_l(1-\alpha_m)}{1+\chi\alpha_k-\alpha_l}} \quad \textit{and} \quad \eta_{r,\omega} = -\frac{K_C}{K_C + K_{P_u}}\tilde{\eta}_{q,\omega} - \frac{\alpha_l}{1-\alpha_l-\frac{\chi}{1+\chi}\alpha_m}\eta_{w,\omega}.$$

Introducing endogenous labor supply of entrepreneurs makes the wage decline stronger compared to the case where only workers' labor supply is endogenous. This can be seen by comparing $\eta_{w,\omega}$ with the one in Part 1 of Proposition E.1 and noting that the last term in the denominator is smaller than one,

$$\frac{\chi}{1+\chi}\frac{1+\chi\alpha_k-\alpha_l(1-\alpha_m)}{1+\chi\alpha_k-\alpha_l} < 1,$$

ensuring that the whole denominator remains positive but smaller than in the case where only workers choose their labor supply. Intuitively, the higher cost of capital reduces the profitability of C corporations and thus their managers' effort. The complementarity of production factors then implies lower demand for (workers') labor and thus a reduction in workers' wages.

F Details on the Case with Uncertainty

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 stochastic. With probability p the entrepreneur is successful and m is equal to the managerial talent of the entrepreneur, θ, while with probability $1-p$ it is equal to 0 and hence the entrepreneur does not produce at all. The key assumption is that m is not known at the time of the key choices (occupation, legal form and investment), i.e. all these decisions are made under uncertainty.

As in the main text, we assume an exogenous collateral constraint

$$e \geq \lambda k,$$

which requires that at least a fraction λ of the capital stock needs to be financed with equity. In the following we restrict attention to equilibria where the condition

$$\frac{\lambda}{1-\lambda} > r \tag{F.1}$$

is satisfied, which rules out default.[F.1] As a consequence the (gross) return on debt will be riskless and equal to r.

F.1 Individual Optimization

F.1.1 Owner-Managers of Pass-Through Businesses

We examine first the problem faced by the owner of a pass-through business. We will assume that labor is only chosen after we observe m, hence labor is only hired by ex post productive managers. As a consequence, labor demand is determined exactly in the same way as in the certainty case:

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

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

$$w = F_l(k, l(k,\theta), \theta).$$

[F.1] Note that this condition is satisfied also in the calibration of the baseline environment without risk.

We denote the consumption of the entrepreneur when successful as

$$c^{P,S}(a,k,\theta) = \underbrace{e^i + (1-\tau_i)\left[F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-e^i)\right]}_{\text{equity plus business income}} + \underbrace{\left[1 + r(1-\tau_i)\right](a-e^i)}_{\text{financial income plus nominal}} .$$

The first term is the entrepreneur's business income. The entrepreneur gets back the full invested equity. The term $(1-\tau_i)r(a-e^i) = (1-\tau_d)r^e(a-e^i)$ is the net financial income of a perfectly diversified portfolio of bonds and/or corporate equity.

If the project fails, on the other hand, the entrepreneur can only consume

$$c^{P,F}(a,k,\theta) = \underbrace{e^i - (1-\tau_i)r(k-e^i)}_{\text{remaining equity}} + \underbrace{\left[1 + (1-\tau_i)r\right](a-e^i)}_{\text{financial income plus nominal}} .$$

While the financial income is the same as in the good state, the business does not make any profits. Furthermore, the entrepreneur loses some of her equity, which is needed to service her debt holders. Observe, however, that debt remains tax deductable, that is the entrepreneur receives a tax credit of $\tau_i r(k-e^i)$.

The pass-through owner's optimization problem can thus be parsimoniously written as

$$\begin{aligned} &\max_{k \leq \frac{a}{\lambda}} \left[pu(c^{P,S}(a,k,\theta)) + (1-p)u(c^{P,F}(a,k,\theta)) \right] \\ \text{s.t.} \quad & c^{P,S}(a,k,\theta) = (1-\tau_i)\left[F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-a)\right] + a \\ & c^{P,F}(a,k,\theta) = -(1-\tau_i)r(k-a) + a \end{aligned}$$

For financially unconstrained entrepreneurs the optimality condition for investment is given by

$$F_k(k,l(k,\theta),\theta) = r\left(1 + \frac{1-p}{p}\frac{u'(c^{P,F}(a,k,\theta))}{u'(c^{P,S}(a,k,\theta))}\right), \tag{F.2}$$

while for (poorer) financially constrained entrepreneurs we have that $k = \frac{a}{\lambda}$. Observe that under risk-neutrality, the optimal unconstrained investment decision becomes $F_k(k,l(k,\theta),\theta) = \frac{r}{p} > r$. The possibility of failure reduces the return of investment and thus the optimal capital stock, relative to the case without risk. With risk aversion, the investment reduction is even bigger as in this case entrepreneurs prefer to invest less of their wealth in their risky business and more of it in the perfectly diversified portfolio.

F.1.2 C-corporation

Next, we will analyse the C corporation owners' problem. Compared to pass-through owners, they can attain a higher level of hedging against the event in which the firm generates no output. They can do so by using external equity to provide collateral for their borrowing, thus shielding away more of their assets. Of course, using external equity is more costly because of issuance costs and the tax wedge. But when entrepreneurs value hedging there is an additional benefit of using outside equity, as outside equity holders lose part of their investment when the project fails while debt holders are paid back in full. This distinction corresponds to the fact that debt has precedent over equity when firms are in financial distress.

Notice first that if the bad state realizes, the profits of the corporation are negative:

$$-[r(k - e^i - e^o) + \kappa + \mu r e^o + w^m_{C,F}(a,\theta)] < 0$$

We assume that in this case, since there is zero production, outside equity holders do not allow the payment of any managerial compensation to the CEO, i.e. $w^m_{C,F}(a,\theta) = 0$. Furthermore, we focus our attention here on the case where equity issuance and firms' incorporation costs are both zero, $\kappa = \mu = 0$.[F.2] This allows us to obtain analytically tractable results while still capturing the main qualitative effects of uncertainty in production. A first implication of this assumption is that, absent equity issuance costs ($\mu = 0$), the entrepreneur will only use outside equity but no inside equity ($e^i = 0$). While the expected return on inside equity is the same as on the (diversified) investment outside their firm, the former is risky, while the latter is safe. Risk averse entrepreneurs will thus avoid to invest any of their wealth in their firm. The second implication is that, given that some equity is needed to access the debt market, and dividend payments to outside equity holders are tax-disadvantaged compared to interest payments to debt holders, the minimal amount of outside equity is chosen to satisfy the collateral constraint: $k = \frac{e^o}{\lambda}$.

Given the above assumptions, outside equity holders of the firm will receive whatever part of their equity is left after debtholders are paid in full. Hence in the failure state the return on equity $r^{e,F}$ is obtained from the expression:

$$(1 + r^{e,F})e^o = e^o - (1 - \tau_c)r(k - e^o),$$

which reflects the fact that the corporation receives a tax credit $\tau_c r(k - e^o)$ for its debt expenditures. Recalling that, as argued above, $e^o = k\lambda$, we have:

$$r^{e,F} = -r(1 - \tau_c)\frac{1 - \lambda}{\lambda} < 0.$$

The higher the debt-to-equity ratio $\frac{1-\lambda}{\lambda}$ or, equivalently, the lower the equity requirement λ, the larger the losses of the firm's equity holders in case of failure. However, the condition (F.1) implies that equity investors will always retain at least some of the equity, which they invested, that is $r^{e,F} > -1$

The entrepreneur's consumption in the bad state is then given by

$$c^{C,F}(a,k,\theta) = (1 - \tau_i)ra + a,$$

that is by the entrepreneur's return on investment outside of her firm. Observe that it is independent of her investment. The legal form of a C corporation allows the entrepreneur to shield all

[F.2] While the condition $w^m_{C,F}(a,\theta) = 0$ limits the hedging benefits of the C corporation form, the assumption $\kappa = \mu = 0$ increases the attractiveness of this form.

her financial wealth from risk.

The entrepreneur's consumption in the bad state is then given by

$$c^{C,F}(a,k,\theta) = (1-\tau_i)ra + a$$

that is, to the entrepreneur's return on investment outside of her firm and is then independent of her investment. The legal form of a C corporation allows the entrepreneur to shield all her financial wealth from risk.

The entrepreneur's net financial (non-wage) income in the success state is still $(1-\tau_i)ra$. In addition she earns the managerial compensation given implicitly by

$$(1-\tau_c)\left[F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-e^o) - \theta w_C^m(a,\theta)\right] = r^{e,S}e^o, \tag{F.3}$$

where $r^{e,S}$ is the return on equity in the success state which needs to be paid to outside investors to ensure the expected net return on equity needs to be equal to the net return of investing elsewhere:

$$p(1-\tau_d)r^{e,S} + (1-p)(1-\tau_d)r^{e,F} = (1-\tau_i)r.$$

Substituting the value found above for $r^{e,F}$ and solving this for $r^{e,S}$ yields:

$$r^{e,S} = \frac{r}{p}\left[\frac{1-\tau_i}{1-\tau_d} + (1-p)(1-\tau_c)\left(\frac{k}{e^o} - 1\right)\right] = \frac{r}{p}\left[\frac{1-\tau_i}{1-\tau_d} + (1-p)(1-\tau_c)\frac{1-\lambda}{\lambda}\right],$$

Substituting this into (F.3), recalling that

$$(1-\tau_d)(1-\tau_c) = \frac{1-\tau_i}{1+\omega}$$

and solving for the managerial wage we get:

$$\theta w_C^m(a,\theta) = F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-e^o) - \frac{r}{p}\left[(1+\omega)e^o + (1-p)(k-e^o)\right].$$

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

$$\begin{aligned}\max_{e^o \geq 0, k \leq \frac{e^o}{\lambda}} pu\Bigg(&(1-\tau_i)\Bigg[F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-e^o) \\ &- \frac{r}{p}\left[(1+\omega)(e^o) + (1-p)(k-e^o)\right]\Bigg] + (1-\tau_i)ra + a\Bigg) \\ &+ (1-p)u\Bigg((1-\tau_i)ra + a\Bigg).\end{aligned}$$

Using the fact that $k = \frac{e^o}{\lambda}$ further simplifies the optimization problem to

$$\max_k pu\Bigg((1-\tau_i)\Big[F(k,l(k,\theta),\theta) - wl(k,\theta) - \frac{r}{p}(1+\lambda\omega)k\Big] + (1-\tau_i)ra + a\Bigg)$$
$$+(1-p)u\Bigg((1-\tau_i)ra + a\Bigg).$$

Note that the entrepreneur's income is affected by the investment level only through its effect on her managerial compensation in the good state.

The first order condition for investment is thus given by

$$F_k(k,l(k,\theta),\theta) = \frac{r}{p}(1+\lambda\omega). \tag{F.4}$$

Observe that, contrary to the case of an unconstrained pass-through, this is independent of the entrepreneur's risk aversion (the relative marginal utilities) as well as of her wealth. The reason for this is twofold: First, as described the entrepreneur has no equity invested in the firm. Second, her managerial income in the negative state will be zero no matter how large the investment is. As the entrepreneur only faces the upside risk, she will maximize managerial compensation in the good state. As in our baseline model without risk, the excess cost of equity (here solely in terms of taxes) results in a lower than socially optimal level of investment for C corporations. Also, the marginal product of capital is equalized across all C corporations.

F.2 Optimal Organizational Form and Misallocation of Capital in the Presence of Risk

While the cost of funds in C corporations is higher, the resort to outside equity allows to reduce the entrepreneur's exposure to risk. How this trade-off is resolved depends on the level of risk aversion. In the following we will assume that the entrepreneur's preferences exhibit constant relative risk aversion.

Assumption 3. *The utility function is given by*

$$u(c) = \frac{c^{1-\zeta}}{1-\zeta},$$

where $\zeta > 0$ denotes the degree of relative risk aversion.

With this utility function we have that

$$\frac{u'(c^{P,F}(a,k,\theta))}{u'(c^{P,S}(a,k,\theta))} = \left(\frac{c^{P,S}(a,k,\theta)}{c^{P,F}(a,k,\theta)}\right)^{\zeta} = \left(\frac{a + (1-\tau_i)\big[F(k,l(k,\theta),\theta) - wl(k,\theta) - r(k-a)\big]}{a - r(1-\tau_i)(k-a)}\right)^{\zeta}.$$

Hence, the marginal product of capital in unconstrained pass-throughs is

$$F_{k,P_u}(a,\theta) = r\left(1 + \frac{1-p}{p}\left(\frac{a + (1-\tau_i)\left[(1-\alpha_l)y_{P_u}(a,\theta) - r(k-a)\right]}{a - r(1-\tau_i)(k-a)}\right)^{\zeta}\right). \tag{F.5}$$

Observe first that the marginal product of capital is increasing in the degree of relative risk aversion ζ. Under risk-neutrality ($\zeta = 0$), the condition becomes $F_k = \frac{r}{p}$, i.e. expected marginal benefits and costs are equalized. However, investment decreases in risk aversion ζ. Since in case of business failure the pass-through entrepreneur is liable with the amount of assets she invests in her firm, with higher risk aversion she chooses to invest more of her wealth in save assets and less in her risky business venture. The marginal product of capital is also increasing in productivity θ. As θ increases, so does the efficient amount of investment. However, if the entrepreneur runs a pass-through business, this implies that more and more of her financial wealth is at risk. Consequently, the wedge between efficient and chosen investment increases in θ and the entrepreneur, if she chooses to form a pass-through business, is able to exploit less and less of her managerial potential, which is complementary to capital.

By contrast, the marginal product of capital is decreasing in wealth a. Given productivity θ, higher wealth implies that the entrepreneur has a larger 'safety net' in case of failure, making her willing to invest more in her risky business venture. Hence, as wealth a increases, the wedge between efficient- and chosen investment decreases. Thus, as in the benchmark framework without risk, those unconstrained pass-throughs that are run by entrepreneurs with high wealth-to-productivity ratios $\frac{a}{\theta}$ will unambiguously have a lower marginal product of capital than C corporations. However, it is no longer unambiguous whether this holds also for poorer (but still unconstrained) pass-through owners. In order to maintain tractability we from now on focus on the case where the coefficient of relative risk aversion is equal to one (log-utility). The following auxiliary Lemma says that in that case a mild technical assumption is sufficient to establish that the marginal product of capital in *all* unconstrained pass-throughs is lower than the one in C corporations, as in our benchmark model without risk.

Lemma F.1. *Consider the case of log utility ($\zeta = 1$) and assume that*[F.3]

$$\frac{\alpha_k}{\alpha_k + \alpha_m} \geq \frac{(1-\tau_i)r}{\lambda - (1-\lambda)(1-\tau_i)r} \frac{1+\lambda\omega}{\lambda\omega} \frac{1-p}{p} \tag{F.6}$$

holds. Then the marginal product of capital in all unconstrained pass-throughs is lower than the one in C corporations.

Figure F.1 illustrates the allocation of capital across entrepreneurs with the same productivity θ but with different wealth a. As mentioned above, the main qualitative difference, relative to the case without risk (compare Figure 2 in the main text), can be observed within the set of unconstrained pass-throughs (P_u). Specifically, now the expected marginal product of capital $pF_k(m)$ is

[F.3] With the values for parameters and for r as in our baseline calibration this condition would require that the success probability $p \geq 87.7\%$. This lower bound for p corresponds to a standard deviation of output that is equal to $\sqrt{p(1-p)} = 32.9\%$ of the output in the success state.

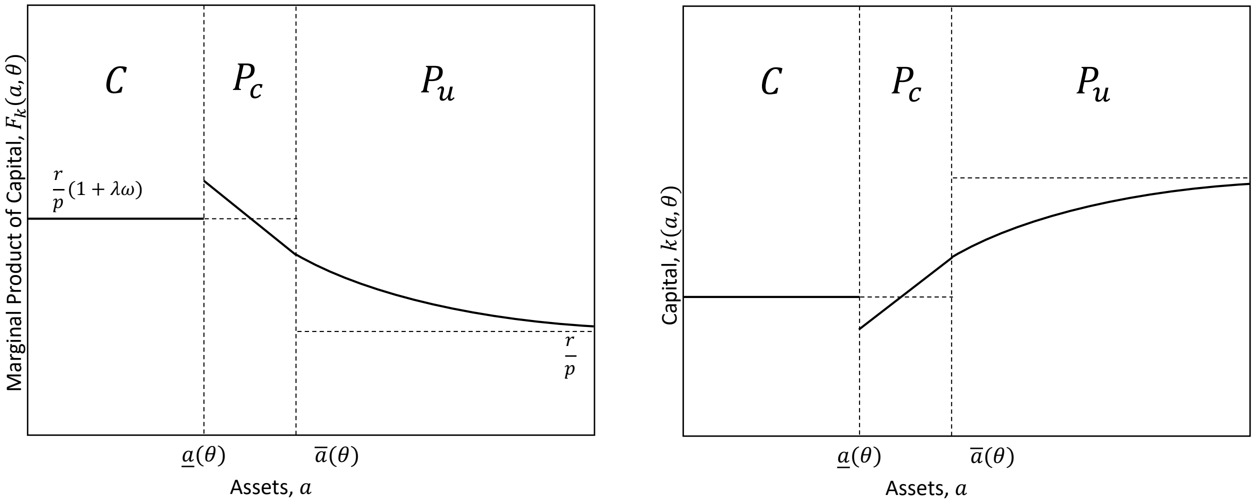

Figure F.1: Capital demand as a function of a (given θ)

higher than the costs of funds r and approaches it only asymptotically as wealth a increases. Observe that the vertical difference between the two horizontal lines $\frac{r}{p}\lambda\omega$ is increasing in the degree of risk (decreasing in the success probability p).

G Proofs of Theoretical Results in the Appendix

G.1 Proof of Proposition D.1

Proof. The first order condition for C corporations' investment is given by

$$F_k(k_C, l_C) = r(1 + \lambda\omega),$$

and the one for pass-throughs is

$$F_k(k_{P_u}, l_{P_u}) = r.$$

As in our setting, the marginal product of labor is always equalized across all firms, that is

$$F_l(k_C, l_C) = F_l(k_{P_u}, l_{P_u}) = w.$$

In the initial situation, where $\omega = 0$, also the marginal product of capital is equalized across both firm types. However, marginally increasing the corporate tax rate by $d\tau_{\tilde{c}}$ gives

$$F_{kk}(k_C, l_C)dk_C + F_{kl}(k_C, l_C)dl_C = dr + r\lambda d\omega$$

and

$$F_{kk}(k_{P_u}, l_{P_u})dk_{P_u} + F_{kl}(k_{P_u}, l_{P_u})dl_{P_u} = dr.$$

Similarly, differentiating the first order conditions for labor gives

$$F_{kl}(k_C, l_C)dk_C + F_{ll}(k_C, l_C)dL_C = F_{kl}(k_{P_u}, l_{P_u})dk_{P_u} + F_{ll}(k_{P_u}, l_{P_u})dl_{P_u} = dw.$$

Furthermore, differentiating the capital and labor market clearing conditions gives

$$dk_{P_u} = -\frac{C}{1-C}dk_C$$

and

$$dl_{P_u} = -\frac{C}{1-C}dL_C.$$

Evaluating these conditions at $\omega = 0$, where marginal products are equalized, gives

$$dr = F_{kk}dk_C + F_{kl}dl_C - r\lambda d\omega,$$

$$dr = -\frac{C}{1-C}(F_{kk}dk_C + F_{kl}dl_C),$$

and

$$dw = F_{kl}dk_C + F_{ll}dl_C = -\frac{C}{1-C}(F_{kl}dk_C + F_{ll}dl_C).$$

The latter immediately implies that $dw = 0$, i.e. that wages do not change, which in turn implies that

$$dl_C = -\frac{F_{kl}}{F_{ll}}dk_C.$$

Hence,

$$dr = -\frac{C}{1-C}\left(F_{kk} - \frac{F_{kl}^2}{F_{ll}}\right)dk_C,$$

and

$$dr = \left(F_{kk} - \frac{F_{kl}^2}{F_{ll}}\right)dk_C - r\lambda d\omega.$$

The latter is equivalent to

$$dr = -\frac{1-C}{C}dr - r\lambda d\omega$$

and thus

$$dr = -Cr\lambda d\omega,$$

which proves part 1 since given that all firms operate the same technology, in the frictionless benchmark $C = \frac{Y_C}{Y}$.

Part 2: Absent equity issuance costs total output is given by

$$\begin{aligned} Y =& Y_C + Y_{P_u} \\ =& F_k K_C + F_l L_C + F_k K_{P_u} + F_l L_{P_u}, \end{aligned}$$

Differentiating with respect to ω and using that the market clearing conditions and fixed factor supply imply

$$\frac{dK_C}{d\omega} + \frac{dK_{P_u}}{d\omega} = \frac{dL_C}{d\omega} + \frac{dL_{P_u}}{d\omega} = 0$$

gives

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

Part 3: Total revenue is given by

$$R = \tau_i Y + (\tau_{\tilde{c}} - \tau_i)\tilde{r}^e \lambda K_C,$$

where

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

Differentiating with respect to $\tau_{\tilde{c}}$ and evaluating at $\omega = 0$ gives

$$\left.\frac{dR}{d\tau_{\tilde{c}}}\right|_{\omega=0} = r\lambda K_C.$$

Part 4: Parts 2 and 3 together imply that

$$\frac{d\tilde{Y}_{net}}{d\tau_{\tilde{c}}} = \frac{dY}{d\tau_{\tilde{c}}} - \frac{dR}{d\tau_{\tilde{c}}} = -r\lambda K_C$$

Furthermore, from part 1 it follows that

$$\left.\frac{dr}{d\tau_{\tilde{c}}}\right|_{\omega=0} = -Cr\lambda \left.\frac{d\omega}{d\tau_{\tilde{c}}}\right|_{\omega=0} = -Cr\lambda \left.\frac{1+\omega}{1-\tau_{\tilde{c}}}\right|_{\omega=0} = -\left.\frac{Cr\lambda}{1-\tau_{\tilde{c}}}\right|_{\omega=0} = -\frac{Cr}{1-\tau_i}.$$

Differentiating total net capital income gives

$$\left.\frac{d[(1-\tau_i)rK]}{d\tau_{\tilde{c}}}\right|_{\omega=0} = -r\lambda CK = -r\lambda K_C = -\left.\frac{dR}{d\tau_{\tilde{c}}}\right|_{\omega=0} = \left.\frac{d\tilde{Y}_{net}}{d\tau_{\tilde{c}}}\right|_{\omega=0}.$$

Consequently 100% of the incidence falls on capital and zero on labor. □

G.2 Proof of Proposition E.1

Proof. The equilibrium is given by equations in the two factor prices r, and w as well as in the variables $\{k_C(\theta), k_{P_u}(\theta), l_C(\theta), l_{P_u}(\theta), \{l_{P_c}(a,\theta)\}_{a\in(\underline{a}(\theta),\lambda k_{P_u}(\theta))}\}_{\theta\in[0,\infty)}$, as well as optimal labor supply decisions of workers, that is $n(a,\nu)$ for all (a,ν).

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

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

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

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

as well as the worker's first order condition for labor supply,

$$(1-\tau_i)w\nu u_c(c^W(a,\nu), n(a,\nu)) + u_n(c^W(a,\nu), n(a,\nu)) = 0,$$

where

$$c^W(a,\nu) = (1-\tau_i)\left[w\nu n(a,\nu) + ra\right] + a.$$

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

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

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

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

The change in aggregate effective labor supply is given by

$$\frac{dL}{d\omega} = \int_0^{\infty}\left[\int_0^{\lambda k_{P_u}(\theta)}\int_{\tilde{\nu}(a,\theta)}^{\infty} \nu\frac{dn(a,\nu)}{d\omega}\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da + \int_{\lambda k_{P_u}(\theta)}^{\infty}\int_{\tilde{\nu}_{P_u}(\theta)}^{\infty} \nu\frac{dn(a,\nu)}{d\omega}\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da\right]d\theta$$

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

$$\int_0^{\infty}\left[\frac{dk_C(\theta)}{d\omega}C(\theta) + \frac{dk_{P_u}(\theta)}{d\omega}P_u(\theta)\right]\gamma_\theta(\theta)d\theta = 0,$$

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

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

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

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

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

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

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

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

Furthermore, using equation (G.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

$$\int_0^\infty\left[\eta_{k_C(\theta),\omega}k_C(\theta)C(\theta)+\eta_{k_{P_u}(\theta),\omega}k_{P_u}(\theta)P_u(\theta)\right]\gamma_\theta(\theta)d\theta=0 \tag{G.6}$$

and

$$\int_0^\infty\left[\eta_{l_C(\theta),\omega}l_C(\theta)C(\theta)-\frac{\eta_{w,\omega}}{1-\alpha_l}\bar{l}_{P_c}(\theta)P_c(\theta)+\eta_{l_{P_u}(\theta),\omega}l_{P_u}(\theta)P_u(\theta)\right]\gamma_\theta(\theta)d\theta=\eta_{L,\omega}L, \tag{G.7}$$

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

Equation (G.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 (G.1) gives

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

which if plugged in above gives

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

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 (G.6) and (G.7) gives

$$\int_0^\infty \left[\frac{1}{\alpha_m}\left[\alpha_l\eta_{w,\omega} + (1-\alpha_l)\eta_{r,\omega} + (1-\alpha_l)\frac{\lambda}{1+\lambda\tilde{\omega}}\right]k_C(\theta)C(\theta) \right.$$
$$\left. + \frac{1}{\alpha_m}\left[\alpha_l\eta_{w,\omega} - (1-\alpha_l)\eta_{r,\omega}\right]k_{P_u}(\theta)P_u(\theta)\right]\gamma_\theta(\theta)d\theta = 0$$

and

$$\int_0^\infty \frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k\eta_{r,\omega} + \alpha_k\frac{\lambda}{1+\lambda\tilde{\omega}}\right]l_C(\theta)C(\theta) + \frac{\eta_{w,\omega}}{1-\alpha_l}\bar{l}_{P_c}(\theta)P_c(\theta)$$
$$+ \frac{1}{\alpha_m}\left[(1-\alpha_k)\eta_{w,\omega} + \alpha_k\eta_{r,\omega}\right]l_{P_u}(\theta)P_u(\theta)\Bigg]\gamma_\theta(\theta)d\theta = -\eta_{L,\omega}L$$

Collecting terms gives

$$\eta_{w,\omega}\frac{\alpha_l}{\alpha_m}(K_C + K_{P_u}) + \eta_{r,\omega}\frac{1-\alpha_l}{\alpha_m}(K_C + K_{P_u}) + \frac{1-\alpha_l}{\alpha_m}\frac{\lambda}{1+\lambda\tilde{\omega}}K_C = 0$$

and

$$\eta_{w,\omega}\frac{\alpha_k\alpha_l + \alpha_m\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l)\alpha_m}(L_C + L_{P_u}) + \eta_{r,\omega}\frac{\alpha_k}{\alpha_m}(L_C + L_{P_u}) + \frac{\alpha_k}{\alpha_m}\frac{\lambda}{1+\lambda\tilde{\omega}}L_C = -\eta_{L,\omega}L.$$

The two equations are equivalent to

$$\eta_{w,\omega}\frac{\alpha_l}{1-\alpha_l} + \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}}\frac{K_C}{K_C + K_{P_u}} = 0 \tag{G.8}$$

and

$$\eta_{w,\omega}\frac{\alpha_k\alpha_l+\alpha_m\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l)\alpha_k}+\eta_{r,\omega}+\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{L_C}{L_C+L_{P_u}}=-\eta_{L,\omega}\frac{L}{L_C+L_{P_u}} \tag{G.9}$$

Subtracting the second from the first equation gives

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

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

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

Using this result and rearranging terms gives

$$\eta_{w,\omega}=-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y}+\eta_{L,\omega}\right]. \tag{G.10}$$

Implicitly deriving the first order condition for labor supply gives

$$\begin{aligned}(1-\tau_i)\nu w\left[\eta_{w,\omega}u_c(a,\nu)+u_{cc}(a,\nu)\frac{dc^W(a,\nu)}{d\omega}+u_{cn}(a,\nu)\frac{dn(a,\nu)}{d\omega}\right]+u_{cn}(a,\nu)\frac{dc^W(a,\nu)}{d\omega}\\+u_{nn}(a,\nu)\frac{dn(a,\nu)}{d\omega}=0,\end{aligned}$$

which is equivalent to

$$\begin{aligned}(1-\tau_i)\nu w\eta_{w,\omega}u_c(a,\nu)+\frac{dc^W(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cc}(a,\nu)+u_{cn}(a,\nu)\Big]\\+\frac{dn(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]=0.\end{aligned}$$

Since

$$\frac{dc^W(a,\nu)}{d\omega}=(1-\tau_i)\left[\eta_{w,\omega}w\nu n(a,\nu)+w\nu\frac{dn(a,\nu)}{d\omega}+\eta_{r,\omega}ra\right].$$

this is equivalent to

$$(1-\tau_i)\nu w\eta_{w,\omega}u_c(a,\nu)+(1-\tau_i)\Big[\eta_{w,\omega}w\nu n(a,\nu)+w\nu\frac{dn(a,\nu)}{d\omega}+\eta_{r,\omega}ra\Big]\Big[(1-\tau_i)\nu w u_{cc}(a,\nu)+u_{cn}(a,\nu)\Big]$$
$$+\frac{dn(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]=0.$$

Collecting terms gives

$$\eta_{w,\omega}(1-\tau_i)\nu w\Big[u_c(a,\nu)+n(a,\nu)\Big]+\eta_{r,\omega}(1-\tau_i)ra$$
$$+\frac{dn(a,\nu)}{d\omega}\Big[\Big((1-\tau_i)w\nu\Big)^2u_{cc}(a,\nu)+2(1-\tau_i)w\nu u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]=0$$

Consider now the different preference specifications of the proposition.

Part 1: GHH preferences. With GHH preferences the first order condition for labor supply becomes

$$(1-\tau_i)w\nu=n^W(a,\nu)^{\frac{1}{\chi}}.$$

Totally differentiating it gives

$$(1-\tau_i)w\nu\eta_{w,\omega}=\frac{1}{\chi}n^W(a,\nu)^{\frac{1}{\chi}}\eta_{n(a,\nu),\omega},$$

which using the first order condition is equivalent to

$$\eta_{n(a,\nu),\omega}=\chi\eta_{w,\omega}.$$

Observe that the right hand side is independent from (a,ν), which implies that

$$\eta_{L,\omega}=\chi\eta_{w,\omega}.$$

Plugging this into equation (G.10) gives

$$\eta_{w,\omega}=-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y}+\chi\eta_{w,\omega}\right]=\hat{\eta}_{w,\omega}-\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\chi\eta_{w,\omega}.$$

Rearranging terms then gives

$$\eta_{w,\omega}=\frac{\hat{\eta}_{w,\omega}}{1+\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\chi},$$

which completes the proof of part 1.

Part 1: Additive separable preferences. With additive separable preferences and all wealth owned by entrepreneurs the first order condition for labor supply becomes

$$n^W(a,\nu)^{\frac{1}{\chi}} = [(1-\tau_i)w\nu n^W(a,\nu))]^{-\gamma}(1-\tau_i)w\nu,$$

which is equivalent to

$$n^W(a,\nu)^{\frac{1}{\chi}+\gamma} = [(1-\tau_i)w\nu]^{1-\gamma}$$

which in turn is equivalent to

$$\log(n^W(a,\nu)) = \frac{\chi(1-\gamma)}{1+\gamma\chi}\log[(1-\tau_i)w\nu].$$

Differentiating with respect to ω gives

$$\eta_{n^W(a,\nu),\omega} n^W(a,\nu) = \frac{\chi(1-\gamma)}{1+\gamma\chi}\eta_{w,\omega}$$

which is equivalent to

$$\eta_{n^W(a,\nu),\omega} = \frac{\chi(1-\gamma)}{1+\gamma\chi}\frac{\eta_{w,\omega}}{n^W(a,\nu)}.$$

Aggregating over all workers gives

$$\begin{aligned}\eta_{L,\omega} =& \int_0^\infty \int_0^\infty \int_{\bar{\nu}(a,\theta)}^\infty \frac{\nu n^W(a,\nu)}{L}\eta_{n^W(a,\nu),\omega} d\nu d\theta da \\ =& \bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}\eta_{w,\omega},\end{aligned}$$

where $\bar{\nu}$ denotes the average productivity of workers. Plugging this into equation (G.10) gives

$$\eta_{w,\omega} = -\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y} + \bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}\eta_{w,\omega}\right],$$

which is equivalent to

$$\eta_{w,\omega} = \frac{\hat{\eta}_{w,\omega}}{1+\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}}$$

From equation (G.8) we know that

$$\eta_{r,\omega} = -\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{K_C}{K_C+K_{P_u}} - \eta_{w,\omega}\frac{\alpha_l}{1-\alpha_l}$$

$$
\begin{aligned}
&= - \frac{\lambda}{1+\lambda\tilde{\omega}} \frac{K_C}{K_C + K_{P_u}} - \frac{\hat{\eta}_{w,\omega}}{1 + \frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}} \frac{\alpha_l}{1-\alpha_l} \\
&= \hat{\eta}_{r,\omega} + \hat{\eta}_{w,\omega} \frac{\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}}{1 + \frac{\alpha_k(1-\alpha_l)}{\alpha_m}\bar{\nu}\frac{\chi(1-\gamma)}{1+\gamma\chi}} \frac{\alpha_l}{1-\alpha_l}.
\end{aligned}
$$

This completes the proof. □

G.3 Proof of Proposition E.2

Proof. The equilibrium is given by equations in the two factor prices r, and w as well as in the variables $\{k_C(\theta), k_{P_u}(\theta), l_C(\theta), l_{P_u}(\theta), \{l_{P_c}(a,\theta)\}_{a\in(\underline{a}(\theta),\lambda k_{P_u}(\theta))}\}_{\theta\in[0,\infty)}$, as well as optimal labor supply decisions of workers and entrepreneurs, that is $n^W(a,\nu)$ for all (a,ν) and $n^E(a,\theta)$ for all (a,θ).

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

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

the market clearing conditions for capital

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

and labor

$$
\begin{aligned}
&\int_0^\infty \Bigg[l_C(\theta) \int_0^{\underline{a}(\theta)} \Gamma_{\nu|a,\theta}(\tilde{\nu}_C(a,\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da + \int_{\underline{a}(\theta)}^{\lambda k_{P_u}(\theta)} l_{P_c}(a,\theta)\Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_c}(a)|a,\theta)\gamma_{a|\theta}(a|\theta)da \\
&\qquad + l_{P_u}(\theta) \int_{\lambda k_{P_u}(\theta)}^\infty \Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_u}|a,\theta)\gamma_{a|\theta}(a|\theta)da \Bigg] \gamma_\theta(\theta)d\theta \\
&= \int_0^\infty \Bigg[\int_0^{\lambda k_{P_u}(\theta)} \int_{\tilde{\nu}(a,\theta)}^\infty \nu n(a,\nu)\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da + \int_{\lambda k_{P_u}(\theta)}^\infty \int_{\tilde{\nu}_{P_u}(\theta)}^\infty \nu n(a,\nu)\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da \Bigg] d\theta,
\end{aligned}
$$

as well as the workers' first order condition for labor supply,

$$
(1-\tau_i)w\nu u_c(c^W(a,\nu), n^W(a,\nu)) + u_n(c^W(a,\nu), n^W(a,\nu)) = 0,
$$

where

$$c^W(a,\nu) = (1-\tau_i)\left[w\nu n^W(a,\nu) + ra\right] + a$$

and the first order conditions for managerial labor supply, that is for all θ

$$\begin{aligned}
\forall a < \underline{a}(\theta) \qquad & (1-\tau_i)F_m(k, l(k, \theta n_C(\theta)), \theta n_C(\theta))\theta = & v'(n_C(\theta)) \\
\forall a \in (\underline{a}(\theta), \lambda k_{P_u}(\theta)) \qquad & (1-\tau_i)F_m(k, l(k, \theta n_{P_c}(a,\theta)), \theta n_{P_c}(a,\theta))\theta = & v'(n_{P_c}(a,\theta)) \\
\forall a > \lambda k_{P_u}(\theta) \qquad & (1-\tau_i)F_m(k, l(k, \theta n_{P_u}(\theta)), \theta n_{P_u}(\theta))\theta = & v'(n_{P_u}(\theta)),
\end{aligned}$$

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

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

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

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

$$P_u(\theta) = \int_0^\infty \int_{\lambda k_{P_u}(\theta)}^\infty \Gamma_{\nu|a,\theta}(\tilde{\nu}_{P_u}(\theta)|a,\theta)\gamma_{a|\theta}(a|\theta)da.$$

The change in aggregate effective labor supply is given by

$$\frac{dL}{d\omega} = \int_0^\infty \left[\int_0^{\lambda k_{P_u}(\theta)} \int_{\tilde{\nu}(a,\theta)}^\infty \nu \frac{dn(a,\nu)}{d\omega}\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da + \int_{\lambda k_{P_u}(\theta)}^\infty \int_{\tilde{\nu}_{P_u}(\theta)}^\infty \nu \frac{dn(a,\nu)}{d\omega}\gamma_{\nu|a,\theta}(\nu|a,\theta)d\nu da \right] d\theta$$

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

$$\int_0^\infty \left[\frac{dk_C(\theta)}{d\omega} C(\theta) + \frac{dk_{P_u}(\theta)}{d\omega} P_u(\theta) \right] \gamma_\theta(\theta)d\theta = 0,$$

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

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

We use a Cobb-Douglas production function, that is

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

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

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

Denote by

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

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

Using this and the specification of the utility function the first order conditions for managerial labor supply become

$$\begin{aligned}
\forall a < \underline{a}(\theta) \qquad & (1-\tau_i)\alpha_m k_C(\theta)^{\alpha_k} l_C(\theta)^{\alpha_l}\theta^{\alpha_m} = & n_C(\theta)^{\frac{1}{\chi}+1-\alpha_m} \\
\forall a \in (\underline{a}(\theta), \lambda k_{P_u}(\theta)) \qquad & (1-\tau_i)\alpha_m \left(\frac{a}{\lambda}\right)^{\alpha_k} l_{P_c(a,\theta)}^{\alpha_l}\theta^{\alpha_m} = & n_{P_c}(a,\theta)^{\frac{1}{\chi}+1-\alpha_m} \\
\forall a > \lambda k_{P_u}(\theta) \qquad & (1-\tau_i)\alpha_m k_{P_u(\theta)}^{\alpha_k} l_{P_u(\theta)}^{\alpha_l}\theta^{\alpha_m} = & n_{P_u}(\theta)^{\frac{1}{\chi}+1-\alpha_m}.
\end{aligned}$$

Implicitly deriving with respect to ω gives

$$\begin{aligned}
\eta_{n_C(\theta),\omega} =& \frac{\alpha_k \eta_{k_C(\theta),\omega} + \alpha_l \eta_{l_C(\theta),\omega}}{\frac{1}{\chi}+1-\alpha_m} \\
\eta_{n_{P_c}(a,\theta),\omega} =& \frac{\alpha_l \eta_{l_{P_c}(a,\theta),\omega}}{\frac{1}{\chi}+1-\alpha_m} \\
\eta_{n_{P_u}(\theta),\omega} =& \frac{\alpha_k \eta_{k_{P_u}(\theta),\omega} + \alpha_l \eta_{l_{P_u}(\theta),\omega}}{\frac{1}{\chi}+1-\alpha_m}
\end{aligned}$$

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

Using the first order conditions these equations can be simplified to

$$(\alpha_k-1)\eta_{k_C(\theta),\omega} + \alpha_l\eta_{l_C(\theta),\omega} + \alpha_m\eta_{n_C(\theta),\omega} = \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}} \tag{G.11}$$

$$(\alpha_k-1)\eta_{k_{P_u}(\theta),\omega} + \alpha_l\eta_{l_{P_u}(\theta),\omega} + \alpha_m\eta_{n_{P_u}(\theta),\omega} = \eta_{r,\omega} \tag{G.12}$$

$$\alpha_k\eta_{k_C(\theta),\omega} + (\alpha_l-1)\eta_{l_C(\theta),\omega} + \alpha_m\eta_{n_C(\theta),\omega} = \eta_{w,\omega} \tag{G.13}$$

$$\alpha_k\eta_{k_{P_u}(\theta),\omega} + (\alpha_l-1)\eta_{l_{P_u}(\theta),\omega} + \alpha_m\eta_{n_{P_u}(\theta),\omega} = \eta_{w,\omega} \tag{G.14}$$

$$(\alpha_l-1)\eta_{l_{P_c}(a,\theta),\omega} + \alpha_m\eta_{n_{P_c}(a,\theta),\omega} = \eta_{w,\omega} \tag{G.15}$$

Defining

$$Z \equiv \frac{1+\chi}{1+\chi(1-\alpha_m)}$$

and plugging in the above expressions for $\eta_{n_C(\theta),\omega}$, $\eta_{n_{P_u}(\theta),\omega}$ and $\eta_{n_{P_c}(a,\theta),\omega}$ gives

$$(\alpha_k Z - 1)\eta_{k_C(\theta),\omega} + \alpha_l Z \eta_{l_C(\theta),\omega} = \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}} \tag{G.16}$$

$$(\alpha_k Z - 1)\eta_{k_{P_u}(\theta),\omega} + \alpha_l Z \eta_{l_{P_u}(\theta),\omega} = \eta_{r,\omega} \tag{G.17}$$

$$\alpha_k Z \eta_{k_C(\theta),\omega} + (\alpha_l Z - 1)\eta_{l_C(\theta),\omega} = \eta_{w,\omega} \tag{G.18}$$

$$\alpha_k Z \eta_{k_{P_u}(\theta),\omega} + (\alpha_l Z - 1)\eta_{l_{P_u}(\theta),\omega} = \eta_{w,\omega} \tag{G.19}$$

$$(\alpha_l Z - 1)\eta_{l_{P_c}(a,\theta),\omega} = \eta_{w,\omega} \tag{G.20}$$

Furthermore, using equation (G.20) 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

$$\int_0^\infty \left[\eta_{k_C(\theta),\omega} k_C(\theta) C(\theta) + \eta_{k_{P_u}(\theta),\omega} k_{P_u}(\theta) P_u(\theta)\right] \gamma_\theta(\theta) d\theta = 0 \tag{G.21}$$

and

$$\int_0^\infty \left[\eta_{l_C(\theta),\omega} l_C(\theta) C(\theta) - \frac{\eta_{w,\omega}}{1-\alpha_l Z} \bar{l}_{P_c}(\theta) P_c(\theta) + \eta_{l_{P_u}(\theta),\omega} l_{P_u}(\theta) P_u(\theta)\right] \gamma_\theta(\theta) d\theta = \eta_{L,\omega} L, \tag{G.22}$$

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

Equation (G.18) is equivalent to

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

Plugging this into equation (G.16) gives

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

which if plugged in above gives

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

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,

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

and

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

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 (G.21) and (G.22) gives

$$\int_0^\infty \left[\frac{1}{1-\alpha_k Z - \alpha_l Z}\left[\alpha_l Z \eta_{w,\omega} + (1-\alpha_l Z)\eta_{r,\omega} + (1-\alpha_l Z)\frac{\lambda}{1+\lambda\tilde{\omega}}\right] k_C(\theta)C(\theta) + \frac{1}{1-\alpha_k Z - \alpha_l Z}\left[\alpha_l Z \eta_{w,\omega} - (1-\alpha_l Z)\eta_{r,\omega}\right] k_{P_u}(\theta)P_u(\theta)\right]\gamma_\theta(\theta)d\theta = 0$$

and

$$\int_0^\infty \frac{1}{1-\alpha_k Z - \alpha_l Z}\left[(1-\alpha_k Z)\eta_{w,\omega} + \alpha_k Z \eta_{r,\omega} + \alpha_k Z \frac{\lambda}{1+\lambda\tilde{\omega}}\right] l_C(\theta)C(\theta) + \frac{\eta_{w,\omega}}{1-\alpha_l Z}\bar{l}_{P_c}(\theta)P_c(\theta) + \frac{1}{1-\alpha_k Z - \alpha_l Z}\left[(1-\alpha_k Z)\eta_{w,\omega} + \alpha_k Z \eta_{r,\omega}\right] l_{P_u}(\theta)P_u(\theta)\Bigg]\gamma_\theta(\theta)d\theta = -\eta_{L,\omega}L$$

Collecting terms gives

$$\eta_{w,\omega}\frac{\alpha_l Z}{1-\alpha_k Z - \alpha_l Z}(K_C + K_{P_u}) + \eta_{r,\omega}\frac{1-\alpha_l Z}{1-\alpha_k Z - \alpha_l Z}(K_C + K_{P_u}) + \frac{1-\alpha_l Z}{1-\alpha_k Z - \alpha_l Z}\frac{\lambda}{1+\lambda\tilde{\omega}}K_C = 0$$

and

$$\eta_{w,\omega}\frac{\alpha_k \alpha_l Z^2 + (1-\alpha_k Z - \alpha_l Z)\frac{L}{L_C + L_{P_u}}}{(1-\alpha_l Z)(1-\alpha_k Z - \alpha_l Z)}(L_C + L_{P_u}) + \eta_{r,\omega}\frac{\alpha_k Z}{1-\alpha_k Z - \alpha_l Z}(L_C + L_{P_u}) + \frac{\alpha_k Z}{1-\alpha_k Z - \alpha_l Z}\frac{\lambda}{1+\lambda\tilde{\omega}}L_C = -\eta_{L,\omega}L.$$

The two equations are equivalent to

$$\eta_{w,\omega}\frac{\alpha_l Z}{1-\alpha_l Z} + \eta_{r,\omega} + \frac{\lambda}{1+\lambda\tilde{\omega}}\frac{K_C}{K_C + K_{P_u}} = 0 \tag{G.23}$$

and

$$\eta_{w,\omega}\frac{\alpha_k\alpha_l Z^2+(1-\alpha_k Z-\alpha_l Z)\frac{L}{L_C+L_{P_u}}}{(1-\alpha_l Z)\alpha_k Z}+\eta_{r,\omega}+\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{L_C}{L_C+L_{P_u}}=-\eta_{L,\omega}\frac{L}{L_C+L_{P_u}} \tag{G.24}$$

Subtracting the second from the first equation gives

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

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

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

Using this result and rearranging terms gives

$$\eta_{w,\omega}=-\frac{\alpha_k Z(1-\alpha_l Z)}{1-\alpha_k Z-\alpha_l Z}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y}+\eta_{L,\omega}\right]. \tag{G.25}$$

Implicitly deriving the first order condition for labor supply gives

$$\begin{aligned}(1-\tau_i)\nu w\left[\eta_{w,\omega}u_c(a,\nu)+u_{cc}(a,\nu)\frac{dc^W(a,\nu)}{d\omega}+u_{cn}(a,\nu)\frac{dn(a,\nu)}{d\omega}\right]+u_{cn}(a,\nu)\frac{dc^W(a,\nu)}{d\omega}&\\ +u_{nn}(a,\nu)\frac{dn(a,\nu)}{d\omega}&=0,\end{aligned}$$

which is equivalent to

$$\begin{aligned}(1-\tau_i)\nu w\eta_{w,\omega}u_c(a,\nu)+\frac{dc^W(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cc}(a,\nu)+u_{cn}(a,\nu)\Big]&\\ +\frac{dn(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]&=0.\end{aligned}$$

Since

$$\frac{dc^W(a,\nu)}{d\omega}=(1-\tau_i)\left[\eta_{w,\omega}w\nu n(a,\nu)+w\nu\frac{dn(a,\nu)}{d\omega}+\eta_{r,\omega}ra\right].$$

this is equivalent to

$$(1-\tau_i)\nu w\eta_{w,\omega}u_c(a,\nu)+(1-\tau_i)\Big[\eta_{w,\omega}w\nu n(a,\nu)+w\nu\frac{dn(a,\nu)}{d\omega}+\eta_{r,\omega}ra\Big]\Big[(1-\tau_i)\nu w u_{cc}(a,\nu)+u_{cn}(a,\nu)\Big]$$
$$+\frac{dn(a,\nu)}{d\omega}\Big[(1-\tau_i)\nu w u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]=$$

Collecting terms gives

$$\eta_{w,\omega}(1-\tau_i)\nu w\Big[u_c(a,\nu)+n(a,\nu)\Big]+\eta_{r,\omega}(1-\tau_i)ra$$
$$+\frac{dn(a,\nu)}{d\omega}\Big[\Big((1-\tau_i)w\nu\Big)^2u_{cc}(a,\nu)+2(1-\tau_i)w\nu u_{cn}(a,\nu)+u_{nn}(a,\nu)\Big]=0$$

Consider now the different preference specifications of the proposition.

With GHH preferences the first order condition for workers' labor supply becomes

$$(1-\tau_i)w\nu=n^W(a,\nu)^{\frac{1}{\chi}}.$$

Totally differentiating it gives

$$(1-\tau_i)w\nu\eta_{w,\omega}=\frac{1}{\chi}n^W(a,\nu)^{\frac{1}{\chi}}\eta_{n(a,\nu),\omega},$$

which using the first order condition is equivalent to

$$\eta_{n(a,\nu),\omega}=\chi\eta_{w,\omega}.$$

Observe that the right hand side is independent from (a,ν), which implies that

$$\eta_{L,\omega}=\chi\eta_{w,\omega}.$$

Plugging this into equation (G.10) gives

$$\eta_{w,\omega}=-\frac{\alpha_kZ(1-\alpha_lZ)}{1-\alpha_kZ-\alpha_lZ}\left[\frac{\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}{1+\lambda\tilde{\omega}\frac{Y_{P_u}}{Y_C+Y_{P_u}}}\frac{\lambda}{1+\lambda\tilde{\omega}}\frac{Y_C}{Y}+\chi\eta_{w,\omega}\right]=\hat{\eta}_{w,\omega}-\frac{\alpha_kZ(1-\alpha_lZ)}{1-\alpha_kZ-\alpha_lZ}\chi\eta_{w,\omega}.$$

Rearranging terms then gives

$$\eta_{w,\omega}=\frac{\hat{\eta}_{w,\omega}}{1+\frac{\alpha_k(1-\alpha_l)}{\alpha_m}\chi-\frac{\chi}{1+\chi}\frac{1+\chi\alpha_k-\alpha_l(1-\alpha_m)}{1+\chi\alpha_k-\alpha_l}}.$$

Finally, plugging this into equation (G.23) and rearranging terms gives the expression for $\eta_{r,\omega}$. This completes the proof. □

G.4 Proof of Lemma F.1

Proof. Define a 'marginally unconstrained' entrepreneur as one with assets a and productivity θ such that

$$F_k(a/\lambda,\theta) - r = r\frac{1-p}{p}\left(\frac{a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]}{a - r(1-\tau_i)\frac{1-\lambda}{\lambda}a}\right),$$

that is such that the leverage constraint is (weakly) binding but the first order condition for unconstrained pass-throughs holds.

In the following we derive his assets a as a function of θ:

$$\left(a - r(1-\tau_i)\frac{1-\lambda}{\lambda}a\right)\left(F_k(a/\lambda,\theta) - r\right) = r\frac{1-p}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right).$$

With the Cobb-Douglas production function we can substitute out the marginal product of capital,

$$\left(a - r(1-\tau_i)\frac{1-\lambda}{\lambda}a\right)\left(\frac{\alpha_k F(a/\lambda,\theta)}{\frac{a}{\lambda}} - r\right) = r\frac{1-p}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right).$$

This equation is equivalent to

$$\begin{aligned}\left(a - r(1-\tau_i)\frac{1-\lambda}{\lambda}a\right)\alpha_k F(a/\lambda,\theta) =& \frac{r}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right)\frac{a}{\lambda} \\ &- r(1-\tau_i)(1-\alpha_l)F(a/\lambda,\theta)\frac{a}{\lambda}\end{aligned}$$

Using that $(1-\alpha_l) = \alpha_k + \alpha_m$ this is the same as

$$\begin{aligned}\left(a + r(1-\tau_i)a\right)\alpha_k F(a/\lambda,\theta) =& \frac{r}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right)\frac{a}{\lambda} \\ &- r(1-\tau_i)\alpha_m F(a/\lambda,\theta)\frac{a}{\lambda}.\end{aligned}$$

Multiplying by $\frac{\lambda}{a}$ gives

$$\lambda\left(1 + r(1-\tau_i)\right)\alpha_k F(a/\lambda,\theta) = \frac{r}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right) - r(1-\tau_i)\alpha_m F(a/\lambda,\theta),$$

which is equivalent to

$$\lambda\left(\alpha_k + \left(\alpha_k + \frac{\alpha_m}{\lambda}\right)r(1-\tau_i)\right)F(a/\lambda,\theta) = \frac{r}{p}\left(a + (1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\right]\right).$$

Multiplying by $\frac{p}{r}$ gives

$$\Big(\alpha_k \frac{\lambda p}{r} + \Big(\lambda p \alpha_k + p\alpha_m\Big)(1-\tau_i)\Big) F(a/\lambda,\theta) = a + (1-\tau_i)\big[(\alpha_k+\alpha_m)F(a/\lambda,\theta) - r\frac{1-\lambda}{\lambda}a\big],$$

which is equivalent to

$$\Bigg(\alpha_k \frac{\lambda p}{r} - \Big((1-\lambda p)\alpha_k + (1-p)\alpha_m\Big)(1-\tau_i)\Bigg) F(a/\lambda,\theta) = a\Bigg(1-(1-\tau_i)\frac{1-\lambda}{\lambda}\Bigg).$$

Dividing by a and using the constant returns to scale property of F gives

$$\Bigg(\alpha_k \frac{\lambda p}{r} - \Big((1-\lambda p)\alpha_k + (1-p)\alpha_m\Big)(1-\tau_i)\Bigg) F(1/\lambda,\theta/a) = 1-(1-\tau_i)\frac{1-\lambda}{\lambda}.$$

Using Cobb-Douglas we can write

$$F\left(\frac{1}{\lambda},\frac{\theta}{a}\right) = \left(\frac{1}{\lambda}\right)^{\alpha_k} l^{\alpha_l} \left(\frac{\theta}{a}\right)^{\alpha_m},$$

where l is given implicitly by the first order condition for labor demand,

$$\alpha_l \left(\frac{1}{\lambda}\right)^{\alpha_k} l^{\alpha_l-1} \left(\frac{\theta}{a}\right)^{\alpha_m} = w,$$

and hence explicitly by

$$l = \left(\frac{\alpha_l}{w}\right)^{\frac{1}{1-\alpha_l}} \left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}} \left(\frac{\theta}{a}\right)^{\frac{\alpha_m}{1-\alpha_l}}.$$

Substituting out labor demand we can write production as

$$F\left(\frac{1}{\lambda},\frac{\theta}{a}\right) = \left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{1-\alpha_l}} \left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}} \left(\frac{\theta}{a}\right)^{\frac{\alpha_m}{1-\alpha_l}}.$$

Therefore, we have

$$\Bigg(\alpha_k \frac{\lambda p}{r} - \Big((1-\lambda p)\alpha_k + (1-p)\alpha_m\Big)(1-\tau_i)\Bigg) \left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{1-\alpha_l}} \left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}} \left(\frac{\theta}{a}\right)^{\frac{\alpha_m}{1-\alpha_l}} = \Bigg(1-(1-\tau_i)r\frac{1-\lambda}{\lambda}\Bigg),$$

which is equivalent to

$$\frac{\alpha_k \frac{\lambda p}{r} - \Big((1-\lambda p)\alpha_k + (1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}} \left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{1-\alpha_l}} \left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}} = \left(\frac{a}{\theta}\right)^{\frac{\alpha_m}{1-\alpha_l}},$$

which in turn is equivalent to

$$\Bigg(\frac{\alpha_k\frac{\lambda p}{r}-\Big((1-\lambda p)\alpha_k+(1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}}\Bigg)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}=\frac{a}{\theta}.$$

Thus for each θ the assets of the marginally unconstrained entrepreneur are given by

$$a^{mu}(\theta)=\Bigg(\frac{\alpha_k\frac{\lambda p}{r}-\Big((1-\lambda p)\alpha_k+(1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}}\Bigg)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}\theta \tag{G.26}$$

The marginal product of capital in an unconstrained pass-through is lower than in a C corporation if and only if

$$\left(\frac{a+(1-\tau_i)\big[(1-\alpha_l)y_{P_u}(a,\theta)-r(k-a)\big]}{a-r(1-\tau_i)(k-a)}\right)^{\zeta}\leq 1+\frac{\lambda\omega}{1-p}.$$

For the 'marginally unconstrained' entrepreneur with assets $a=\lambda k(a,\theta)$ this becomes

$$\left(\frac{a+(1-\tau_i)\big[(1-\alpha_l)F(a/\lambda,\theta)-r\frac{1-\lambda}{\lambda}a\big]}{a-r(1-\tau_i)\frac{1-\lambda}{\lambda}a}\right)^{\zeta}\leq 1+\frac{\lambda\omega}{1-p}.$$

Using log utility ($\zeta=1$) gives

$$a+(1-\tau_i)\left[(1-\alpha_l)F(a/\lambda,\theta)-r\frac{1-\lambda}{\lambda}a\right]\leq\left[a-r(1-\tau_i)\frac{1-\lambda}{\lambda}a\right]\left(1+\frac{\lambda\omega}{1-p}\right),$$

which is equivalent to

$$(1-\tau_i)(1-\alpha_l)F(a/\lambda,\theta)\leq\left[a-r(1-\tau_i)\frac{1-\lambda}{\lambda}a\right]\frac{\lambda\omega}{1-p}.$$

Again using the constant returns to scale property of the production function gives

$$(1-\tau_i)(1-\alpha_l)F\left(\frac{1}{\lambda},\frac{\theta}{a}\right)\leq\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p},$$

and hence

$$F\left(\frac{1}{\lambda},\frac{\theta}{a}\right)\leq\frac{1}{(1-\tau_i)(1-\alpha_l)}\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}.$$

Using the Cobb-Douglas production function this becomes

$$F\left(\frac{1}{\lambda},\frac{\theta}{a}\right)=\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{1-\alpha_l}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}}\left(\frac{\theta}{a}\right)^{\frac{\alpha_m}{1-\alpha_l}}\leq\frac{1}{(1-\tau_i)(1-\alpha_l)}\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p},$$

which is equivalent to

$$\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{1-\alpha_l}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{1-\alpha_l}}\leq\left(\frac{a}{\theta}\right)^{\frac{\alpha_m}{1-\alpha_l}},$$

and therefore

$$\left(\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}\leq\frac{a}{\theta}.$$

Thus for any θ the MPK is higher in C corporations than in a pass-through run by a 'marginally unconstrained' entrepreneur, if his assets satisfy

$$a^{mu}(\theta)\geq\left(\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}\theta.$$

Plugging in equation (G.26) for $a^{mu}(\theta)$ this becomes

$$\left(\frac{\alpha_k\frac{\lambda p}{r}-\Big((1-\lambda p)\alpha_k+(1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}\theta\geq$$
$$\left(\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\left(\frac{\alpha_l}{w}\right)^{\frac{\alpha_l}{\alpha_m}}\left(\frac{1}{\lambda}\right)^{\frac{\alpha_k}{\alpha_m}}\theta,$$

which is equivalent to

$$\left(\frac{\alpha_k\frac{\lambda p}{r}-\Big((1-\lambda p)\alpha_k+(1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}}\geq\left(\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}\right)^{\frac{\alpha_k+\alpha_m}{\alpha_m}},$$

which in turn is equivalent to

$$\frac{\alpha_k\frac{\lambda p}{r}-\Big((1-\lambda p)\alpha_k+(1-p)\alpha_m\Big)(1-\tau_i)}{1-(1-\tau_i)r\frac{1-\lambda}{\lambda}}\geq\frac{(1-\tau_i)(1-\alpha_l)}{\left[1-r(1-\tau_i)\frac{1-\lambda}{\lambda}\right]\frac{\lambda\omega}{1-p}}.$$

Multiplying by the denominator of the right hand side (which is positive because of condition (F.1)) gives

$$\left(\alpha_k \frac{\lambda p}{r} - \left((1-\lambda p)\alpha_k + (1-p)\alpha_m\right)(1-\tau_i)\right)\frac{\lambda\omega}{1-p} \geq (1-\tau_i)(1-\alpha_l),$$

or equivalently

$$\left(\alpha_k \frac{\lambda p}{1-p} - \left(\frac{1-\lambda p}{1-p}\alpha_k + \alpha_m\right)(1-\tau_i)r\right)\lambda\omega \geq (1-\tau_i)r(\alpha_k+\alpha_m).$$

Rearranging terms gives

$$\alpha_k \lambda^2 \omega \frac{p}{1-p} \geq (1-\tau_i)r\left[\left(1+\lambda\omega\frac{1-\lambda p}{1-p}\right)\alpha_k + (1+\lambda\omega)\alpha_m)\right]$$

and dividing by $\alpha_k + \alpha_m$ gives

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda^2\omega\frac{p}{1-p} \geq (1-\tau_i)r\left[1+\lambda\omega\left(\frac{1-\lambda p}{1-p}\frac{\alpha_k}{\alpha_k+\alpha_m} + \frac{\alpha_m}{\alpha_k+\alpha_m}\right)\right],$$

which is equivalent to

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda \geq (1-\tau_i)r\left[\frac{1-p}{p}\frac{1}{\lambda\omega} + \left(\frac{1-\lambda p}{p}\frac{\alpha_k}{\alpha_k+\alpha_m} + \frac{1-p}{p}\frac{\alpha_m}{\alpha_k+\alpha_m}\right)\right],$$

or

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda \geq (1-\tau_i)r\left[\frac{1-p}{p}\frac{1}{\lambda\omega} + \frac{1}{p} - \left(\lambda\frac{\alpha_k}{\alpha_k+\alpha_m} + \frac{\alpha_m}{\alpha_k+\alpha_m}\right)\right].$$

This, in turn, can be written as

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda \geq (1-\tau_i)r\left[\frac{1+\lambda\omega-p}{p\lambda\omega} - \left(\lambda\frac{\alpha_k}{\alpha_k+\alpha_m} + 1 - \frac{\alpha_k}{\alpha_k+\alpha_m}\right)\right]$$

and hence

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda \geq (1-\tau_i)r\left[\frac{1+\lambda\omega-p}{p\lambda\omega} - 1 + (1-\lambda)\frac{\alpha_k}{\alpha_k+\alpha_m}\right].$$

It is easy to show that this is equivalent to

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\lambda \geq (1-\tau_i)r\left[\frac{1+\lambda\omega}{\lambda\omega}\frac{1-p}{p} + (1-\lambda)\frac{\alpha_k}{\alpha_k+\alpha_m}\right],$$

which in turn is equivalent to

$$\frac{\alpha_k}{\alpha_k+\alpha_m}\left[\lambda - (1-\lambda)(1-\tau_i)r\right] \geq (1-\tau_i)r\frac{1+\lambda\omega}{\lambda\omega}\frac{1-p}{p}.$$

Multiplying by $\lambda - (1-\lambda)(1-\tau_i)r$, which is again positive by condition (F.1) then gives the condition stated in the lemma,

$$\frac{\alpha_k}{\alpha_k + \alpha_m} \geq \frac{(1-\tau_i)r}{\lambda - (1-\lambda)(1-\tau_i)r} \frac{1+\lambda\omega}{\lambda\omega} \frac{1-p}{p}.$$

We have shown that this is a sufficient condition for the marginal product of 'marginally unconstrained' entrepreneurs to be lower than the one of C corporations. Since this holds for any θ and given that the marginal product of capital in unconstrained pass-through is decreasing in wealth a, it immediately follows that all unconstrained pass-throughs must have a lower marginal product of capital than C corporations if this condition holds. This completes the proof. □