Online Appendix for “A Simple Model of Corporate Tax Incidence”

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A. Analytical results

In the Cobb-Douglas case, we have that \( \phi_k = \phi v a k_D^{-1} \) and \( \phi_l = \phi v (1-a) l^{-1} \). Combining both first-order conditions yields \( al/(1-a) k_D = r^*/(1-t) w \). Then, some simple algebra allows us to compute closed-form solutions for factor demands:

\[
\begin{align*}
  k_D(w, t) &= (v \psi) \frac{1}{w} \left[ \frac{a(1-t)}{r^*} \right]^{1-(1-a)v} \left[ \frac{1-a}{w} \right] \left( \frac{1}{1-a} \right)^{1-(1-a)v}, \\
  l(w, t) &= (v \psi) \frac{1}{w} \left[ \frac{a(1-t)}{r^*} \right]^{1-(1-a)v} \left[ \frac{1-a}{w} \right] \left( \frac{1}{1-a} \right)^{1-(1-a)v}.
\end{align*}
\]

Taking logs and differentiating yields:

\[
\begin{align*}
  d \log k_D(w, t) &= \frac{1 - (1-a)v}{1-v} d \log(1-t) - \frac{(1-a)v}{1-v} d \log w, \\
  d \log l(w, t) &= \frac{av}{1-v} d \log(1-t) - \frac{1-av}{1-v} d \log w,
\end{align*}
\]

where we assumed \( d \log v = d \log \psi = d \log a = d \log r^* = 0 \). Let \( \epsilon^S = f(w) w/L \) denote the labor supply elasticity. Then, differentiating the labor market equilibrium yields:

\[
f(w) dw = Nd l(w, t) \iff \epsilon^S d \log w = d \log l(w, t).
\]

Replacing in the input demands we get:

\[
\begin{align*}
  d \log k_D(w, t) &= \frac{1 - (1-a)v}{1-v} d \log(1-t) - \frac{(1-a)v}{\epsilon^S (1-v)} d \log l(w, t), \\
  d \log l(w, t) &= \frac{av}{1-v} d \log(1-t) - \frac{1-av}{\epsilon^S (1-v)} d \log l(w, t).
\end{align*}
\]

Starting from the labor demand equation, we have that:

\[
\epsilon_l = \frac{d \log l(w, t)}{d \log(1-t)} = \left( 1 + \frac{1 - av}{\epsilon^S (1-v)} \right)^{-1} \frac{av}{1-v} = \frac{\epsilon^S av}{\epsilon^S (1-v) + 1 - av},
\]

and \( \epsilon_w = (\epsilon^S)^{-1} \epsilon_l \). Note that \( d \log L = d \log(N l(w, t)) = d \log N + d \log l(w, t) \), so \( \epsilon_l = \epsilon_L \) when \( N \) is fixed. Assuming that \( \epsilon^S \) is locally constant, it follows that:

\[
\frac{\partial \epsilon_l}{\partial a} = \frac{\epsilon^S v (\epsilon^S (1-v) + 1)}{(\epsilon^S (1-v) + 1 - av)^2} = \frac{\epsilon_l (\epsilon^S (1-v) + 1)}{a (\epsilon^S (1-v) + 1 - av)} > 0.
\]

Regarding capital, using the expressions above, it follows that:

\[
\epsilon_k = \frac{d \log k_D(w, t)}{d \log(1-t)} = \frac{1 - (1-a)v}{1-v} \frac{1 - (1-a)v}{\epsilon^S (1-v) d \log(1-t)} = 1 - (1-a) v \left( 1 - (1-a) v \frac{1 - \epsilon^S (1-v) + 1 - av}{\epsilon^S (1-v) + 1 - av} \right),
\]

\[
= \frac{1}{1-v} \left( 1 - (\epsilon^S (1-v) + 1) (1-a) v \right).
\]
Note that \( \varepsilon_k > 0 \) since \((\varepsilon^S(1 - v) + 1)(1 - a)v < \varepsilon^S(1 - v) + 1 - av \) if and only if \( v < 1 \).
Then:

\[
\frac{\partial \varepsilon_k}{\partial a} = \frac{-1}{1 - v} \left( -\frac{(\varepsilon^S(1 - v) + 1)v(\varepsilon^S(1 - v) + 1 - av) + (\varepsilon^S(1 - v) + 1)(1 - a)v^2}{(\varepsilon^S(1 - v) + 1 - av)^2} \right),
\]

\[
\frac{\partial \varepsilon_k}{\partial a} = \frac{- (\varepsilon^S(1 - v) + 1)v}{1 - v} \left( \frac{- (\varepsilon^S(1 - v) + 1 - av) + (1 - a)v}{(\varepsilon^S(1 - v) + 1 - av)^2} \right),
\]

\[
\frac{\partial \varepsilon_k}{\partial a} = \frac{- (\varepsilon^S(1 - v) + 1)v}{1 - v} \left( \frac{- (\varepsilon^S + 1)(1 - v)}{(\varepsilon^S(1 - v) + 1 - av)^2} \right) > 0.
\]

By comparing the expressions, we can also note that \( \varepsilon_k > \varepsilon_l \) if and only if \( \varepsilon^S(1 - v) + 1 > 0 \), a condition that always holds in this model.

Regarding effects on pre-tax profits, introducing the optimal factor demands in the pre-tax profits function yields, after some algebra:

\[
\pi_D(w, t) = \left( \frac{a(1 - t)}{\tau^*} \right)^{\frac{av}{1 - \tau^*}} \left( \frac{1}{w} \right)^{\frac{(1 - a)}{1 - \tau^*}} \Omega,
\]

where \( \Omega = \psi(v^S) \frac{1}{\tau^*} (1 - a)^{\frac{(1 - a)}{1 - \tau^*}} - (v^S) \frac{1}{\tau^*} (1 - a)^{\frac{1 - a}{1 - \tau^*}} \) is a constant. Then:

\[
d \log \pi_D(w, t) = \frac{av}{1 - v} d \log (1 - t) - \frac{v(1 - a)}{1 - v} d \log w,
\]

so

\[
\varepsilon_\pi = \frac{d \log \pi_D(w, t)}{d \log (1 - t)} = \frac{av}{1 - v} - \frac{v(1 - a)}{\varepsilon^S(1 - v)} \varepsilon_l.
\]

Then:

\[
\frac{\partial \varepsilon_\pi}{\partial a} = \frac{v}{1 - v} + \frac{v \varepsilon_l}{\varepsilon^S(1 - v)} - \frac{v(1 - a)}{\varepsilon^S(1 - v)} \frac{\partial \varepsilon_l}{\partial a},
\]

\[
\frac{\partial \varepsilon_\pi}{\partial a} = \frac{v}{1 - v} \left( 1 + \frac{av}{\varepsilon^S(1 - v) + 1 - av} - \frac{(1 - a)v(\varepsilon^S(1 - v) + 1)}{(\varepsilon^S(1 - v) + 1 - av)^2} \right).
\]

Then, \( \partial \varepsilon_\pi / \partial a > 0 \) if:

\[
1 + \frac{av}{\varepsilon^S(1 - v) + 1 - av} - \frac{(1 - a)v(\varepsilon^S(1 - v) + 1)}{(\varepsilon^S(1 - v) + 1 - av)^2} > 0,
\]

which holds if \( \varepsilon^S(1 - v) + 1 > 0 \), a condition that is always true. Then, \( \partial \varepsilon_\pi / \partial a > 0 \).

Finally, to see the role of wage adjustments in mediating factor demands, we have that:

\[
\frac{\partial \varepsilon_l}{\partial \varepsilon^S} = \frac{1 - av}{(\varepsilon^S(1 - v) + 1 - av)^2} > 0,
\]

\[
\frac{\partial \varepsilon_k}{\partial \varepsilon^S} = \frac{(1 - a)av^2}{(\varepsilon^S(1 - v) + 1 - av)^2} > 0.
\]
Figure B.1. Comparative statics with respect to the corporate tax rate, \( t \), low capital-labor substitution \((\rho = -1)\)

A. Employment \( L \)

B. Wages \( w \)

C. Domestic capital \( k_D \)

D. Domestic pre-tax profits \( \pi_D \)

Note: This figure shows how the employment, wage, domestic capital, and domestic pre-tax profit responses to the corporate tax depend on the capital intensity, \( a \), of the firm. In each figure, the outcome is normalized to be equal to 1 under \( t = 0 \), and the different lines represent different values of \( a \), from \( a = 0.25 \) (lighter) to \( a = 0.75 \) (darker). These figures use \( \rho = -1, v = 0.79, r^* = 0.042, N = 10, \psi = 0.15, \) and \( c \sim \exp(0.2) \).
Figure B.2. Comparative statics with respect to the corporate tax rate, $t$, high capital-labor substitution ($\rho = 0.8$)

A. Employment $L$

B. Wages $w$

C. Domestic capital $k_D$

D. Domestic pre-tax profits $\pi_D$

Note: This figure shows how the employment, wage, domestic capital, and domestic pre-tax profit responses to the corporate tax depend on the capital intensity, $a$, of the firm. In each figure, the outcome is normalized to be equal to 1 under $t = 0$, and the different lines represent different values of $a$, from $a = 0.25$ (lighter) to $a = 0.75$ (darker). These figures use $\rho = 0.8$, $v = 0.79$, $r^* = 0.042$, $N = 10$, $\psi = 0.15$, and $c \sim \exp(0.2)$. 