Discussion of
"Taxation and the Life-Cycle of Firms"

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Summary reaction

- **New:** Coherent framework to study the effects of corporate income taxes, dividend income taxes and capital gains taxes for the life-cycle of firms and macroeconomic aggregates.

- I like the paper a lot! It provides clear intuitions behind the effects of different types of taxes.

- Two sets of comments:
    - Set of firms that this theory applies to. How well does it describe the life-cycle of an average US firm?

    - Modelling choices and quantitative analysis.

Simplified Model Overview

- Firm has access to DRS technology. It draws productivity z upon entry and choose the initial equity $k_0(z)$.

- Tax instruments: (1) τ_d - dividend income tax, (2) τ_r - interest income tax, (3) τ_g - capital gain tax, (4) τ_c - corporate income tax.

- **Financial friction:** cost ξ per unit of equity issued.

- Mass of entering firms M, free entry conditions sets the value of the new firm to the fixed cost of entry c_e.

- In the quantitative version of the model: (i) z varies over time (ii) fixed investment costs.

Dividend income tax

Key equations:

$$(1 - \tau_c)\pi'(z, k^*) = \frac{\rho}{1 - \tau_g}$$

$$(1 - \tau_c)\pi(z, k^*) = d^*$$

$$V^{\mathrm{m}}(z) = \frac{1 - \tau_d}{\rho} d^*$$

$$V^{\mathrm{n}}(z) = \frac{1 - \tau_d}{\rho} e^{-\left(\frac{\rho}{1 - \tau_g}\right) T(z, k_0)} d^*$$

- k^* and d^* unchanged. $V^{\mathrm{m}} \downarrow$ and $V^{\mathrm{n}} \downarrow$.
- Additional effects on new firms: $V^{\mathrm{n}} \downarrow \Rightarrow k_0 \downarrow$ and $T(z, k_0) \uparrow$.
- **Smaller** start-ups and **longer** growth phase.

Capital gains tax

Key equations:

$$(1 - \tau_c)\pi'(z, k^*) = \frac{\rho}{1 - \tau_g}$$

$$(1 - \tau_c)\pi(z, k^*) = d^*$$

$$V^{\mathrm{m}}(z) = \frac{1 - \tau_d}{\rho} d^*$$

$$V^{\mathrm{n}}(z) = \frac{1 - \tau_d}{\rho} e^{-\left(\frac{\rho}{1 - \tau_g}\right) T(z, k_0)} d^*$$

- $k^* \downarrow$ and $d^* \downarrow$. $V^{\mathrm{m}} \downarrow$ and $V^{\mathrm{n}} \downarrow \Rightarrow k_0 \downarrow$.
- Additional effects on new firms: $k_0 \uparrow$ and $T(z, k_0) \downarrow$.
- **Larger** start-ups and **shorter** growth phase.

Corporate income tax

Key equations:

$$(1 - \tau_c)\pi'(z, k^*) = \frac{\rho}{1 - \tau_g}$$

$$(1 - \tau_c)\pi(z, k^*) = d^*$$

$$V^{\mathrm{m}}(z) = \frac{1 - \tau_d}{\rho} d^*$$

$$V^{\mathrm{n}}(z) = \frac{1 - \tau_d}{\rho} e^{-\left(\frac{\rho}{1 - \tau_g}\right) T(z, k_0)} d^*$$

- $k^* \downarrow$ and $d^* \downarrow$. $V^{\mathrm{m}} \downarrow$ and $V^{\mathrm{n}} \downarrow \Rightarrow k_0 \downarrow$.
- Additional effects on new firms: $T(z, k_0) \uparrow$ due to smaller retained earnings.
- **Smaller** start-ups and **shorter/longer** growth phase.

Quantitative results

Panel A: Aggregate Effects.

	Output	Capital	TFP	Mass Entry	Wage	Revenue Neutral Tax
1.- $\tau_c = 0$	13.6	35.2	5.2	39.3	13.6	$\tau_d = \tau_g = \tau_r = 0.39$
2.- $\tau_c = 0.17$	8.1	20.1	3.1	22.7	8.1	$\tau_d = \tau_g = \tau_r = 0.28$
3.- $\tau_c = 0.17$	0.34	15.5	-3.3	-17.3	0.34	$\tau_d = 0.41, \tau_g = 0.15, \tau_r = 0.25$

- The main reform:
  $\tau_c : 0.35 \to 0, \tau_d : 0.15 \to 0.39, \tau_g : 0.15 \to 0.39, \tau_r : 0.15 \to 0.39.$

- **Asymmetric effects** of reform: increases the value of entry more than the value of incumbent firms.

- Reallocation of resources from unconstrained firms (mature) towards constrained ones (young).

- The GE effect dampens the value of the incumbent firms.

"Taxation and The Life Cycle of (publicly traded?) C corporations"

- Most businesses in the US are unlike the firms in this model, they are **not subject** to the dividend and corporate income taxes.

- Importantly, the majority of start-ups are not organized as C corporations.

- Tax reforms induce firms to change the legal form of organization.

Most of businesses are pass-throughs ...

	Employment				
---	<20	20-99	100-499	500+	Total
Total					
Number of firms	89.24	8.92	1.52	0.33	100
Employment	16.75	16.64	14.11	52.50	100

Source: Statistics of U.S. Businesses (SUSB) for 2015

Most of businesses are pass-throughs ...

| | **Employment** | | | | |
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Total					
Number of firms	89.24	8.92	1.52	0.33	100
Employment	16.75	16.64	14.11	52.50	100
C corporations					
Number of firms					16.86
Employment					44.20
Pass-throughs					
Number of firms					83.14
Employment					55.80

Source: Statistics of U.S. Businesses (SUSB) for 2015

Most of businesses are pass-throughs ...

	Employment				
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Total					
Number of firms	89.24	8.92	1.52	0.33	100
Employment	16.75	16.64	14.11	52.50	100
C corporations					
Number of firms	16.04	21.75	28.41	51.97	16.86
Employment	18.09	21.71	26.84	64.33	44.20
Pass-throughs					
Number of firms	83.96	78.25	71.59	48.03	83.14
Employment	81.91	78.29	73.16	35.67	55.80

Source: Statistics of U.S. Businesses (SUSB) for 2015

- A theory in the paper applicable to at most **2.5** percent of the US businesses, which account for at most **41.2** percent of employment.

Increases in pass-throughs around major tax reforms

Probability of C-corp pass through conversion — Equally weighted, Payroll weighted

New business legal forms — C corporation, Partnerships, Sole Props, S Corporations
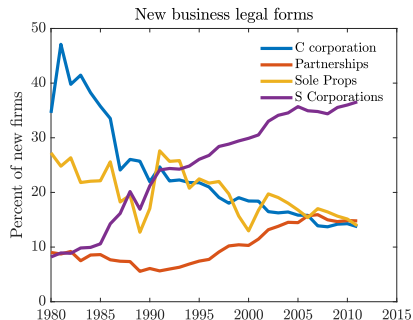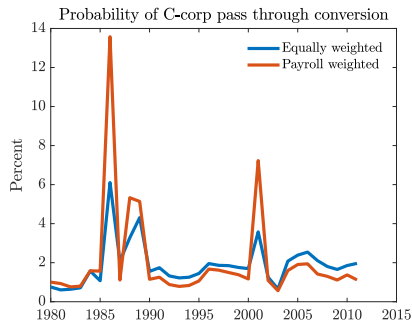
Source: Dyrda, Pugsley (2018). Data from Census LBD and Business Register.

- Conversions surge around major tax reforms: Tax Reform Act of 1986, Economic Growth and Tax Relief Reconciliation 2001.
- At the entry margin, pass-through account for **86.3** percent of start-ups.

Top rates   Average marginal rates

Comments on the model and quantitative analysis

1. Disentangle the elasticity of entry vs. elasticity of labor supply.
   - Now, entry is infinitely elastic. Example of modified entry condition:

   $$M = \exp\left(\eta\left(\int_1^\infty v^e(z_0; p)g^e(z_0)\,dz_0 - c_e\right)\right)$$

   when $\eta \to \infty$ gives back the original one.

   - Labor supply is infinitely elastic. Impose some curvature on the disutility of labor.

   - Would the results survive?

2. Disentangle the intensive margin vs. extensive margin effect.

   - Is the intensive margin (keeping entry fixed) or the extensive margin (new firms) driving the results?

# Comments on the model and quantitative analysis

3. Calibration strategy.

   • Model now calibrated to match: (i) size distribution in the BDS (entire population of private businesses) and (ii) Compustat (publicly traded companies).

   • BDS size distribution is not C corporations size distribution. There is data on the latter in SUSB.

   • Implicit assumption that all the C-corps are like publicly traded companies. Any evidence on that?
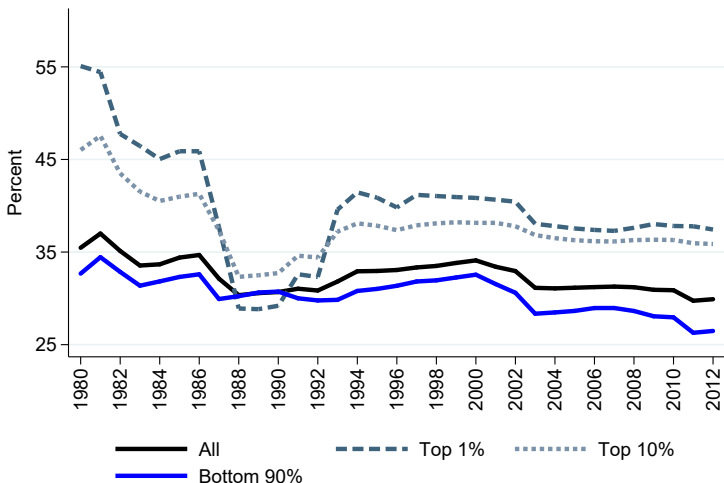
Conclusions

- Very interesting paper on an important and understudied topic. I learned a lot.

- Need to clarify the focus of the paper. Is it all firms, C corps, or publicly traded companies?

Marginal income tax rates
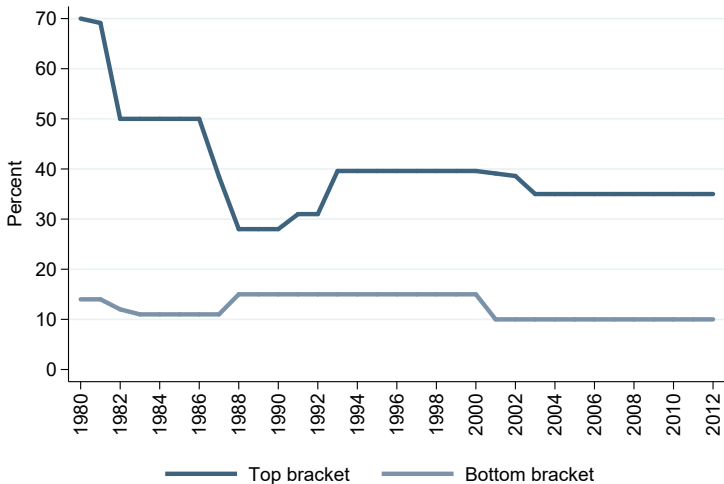
Source: U.S. Department of the Treasury. Internal Revenue Service

Average marginal personal income tax rates

Source: Data from Mertens, Olea (2018)

A very recent example: WSJ May 3, 2018

"KKR to Ditch Partnership Structure and Become Corporation"

For decades, businesses have typically preferred to avoid becoming C corporations, which pay taxes on their profits and then face another layer of taxation when those profits are distributed to shareholders as dividends; partnerships, on the other hand, allow income to pass through directly to owners' tax returns and get taxed at individual rates. Under the old tax law, C corporation status mostly made sense for companies that wanted access to public capital markets.