Recent Changes in Firm Dynamics and the Nature of Economic Growth

Markus Kondziella
University of St. Gallen

EEA-ESEM (Rotterdam)

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Motivation

- Firm entry, firm size growth and aggregate productivity growth are directly linked
  - Starting small, entering firms replace competing firms through product improvements
  - Firms that improve their products attract new customers, raising their market shares
  - Product improvements generate aggregate productivity growth
- Schumpeterian growth theory highlights link b/w entry, firm growth & aggregate growth
- This paper presents a novel finding in high-quality Swedish registry data
  - Systematic changes in the dynamics of firm size

The dynamics of firm size

- Characterize firm size as a function of firm age in the unbalanced panel of firms

$$\ln \text{Size}_{f,t} = \gamma_0 + \sum_{a_f=1}^{20} \gamma_{a_f} \mathbb{1}_{\text{Age}_{f,t}=a_f} + \theta_c + \theta_k + \epsilon_{f,t} \tag{1}$$

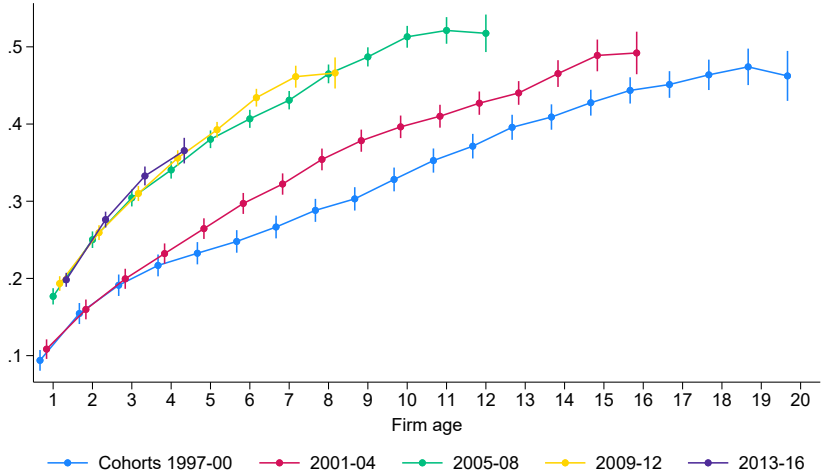
  - $\text{Size}_{f,t} \in \{\text{Employment}_{f,t}, \text{Sales}_{f,t}\}$ for firm f
  - $\mathbb{1}_{\text{Age}_{f,t}=a_f}$ age dummies
  - θ_c cohort c fixed effects
  - θ_k 5-digit industry k fixed effects

- $\gamma_{a_1}, \ldots, \gamma_{a_f}, \ldots \gamma_{a_{20}}$ capture average firm size conditional on age relative to entry

$$\gamma_{a_f} = E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = a_f, c, k\right] - E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0, c, k\right]$$

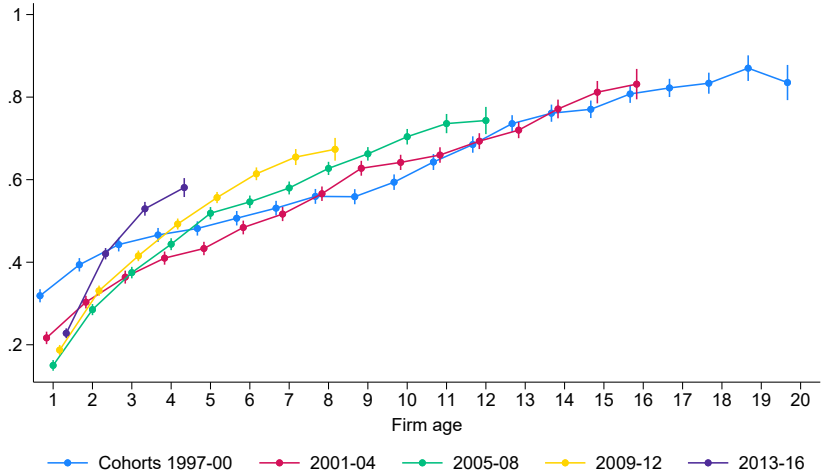
- Divide cohorts 1997–2017 into five groups and estimate (1) by cohort group

Average firm size relative to entry: log employment



Notes: graph shows γ_{a_f} indicating the difference in log employment between age a_f and zero. 95% confidence intervals shown.

Average firm size relative to entry: log sales



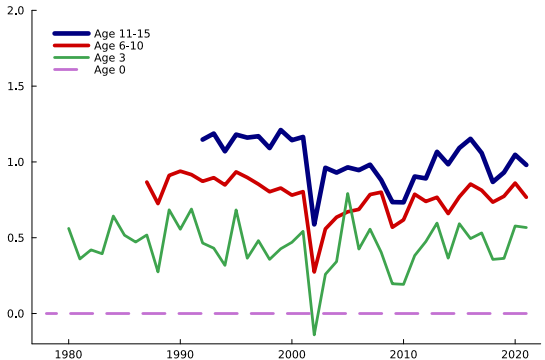
Notes: graph shows γ_{a_f} indicating the difference in log sales between age a_f and zero. Nominals sales deflated to 2017-SEK. 95% confidence intervals shown.

External validity: trends in firm size in the U.S.

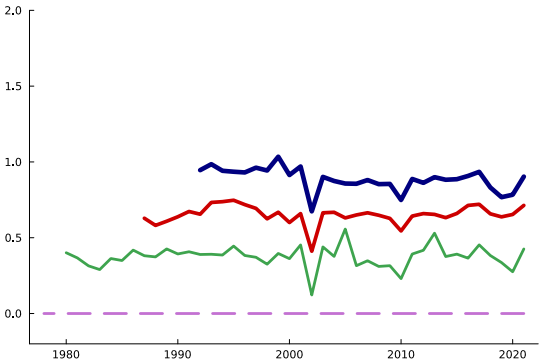
- U.S. Census Data: Business Dynamism Statistics (BDS)
- Karahan, Pugsley, Sahin (AER, 2022), Hopenhayn, Neira, Singhania (ECMA, 2022)
  - Employment conditional on firm age has been stable over the last three decades
  - Suggests that average firm size relative to entry has not changed
  - Both studies *pool firms across all sectors* of the U.S. economy
- Substantial heterogeneity in firm size trends across sectors

Log employment gap to entrants (age zero)

(a) Manufacturing

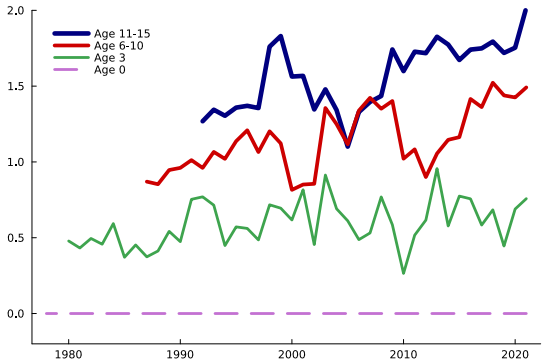


(b) Retail Trade

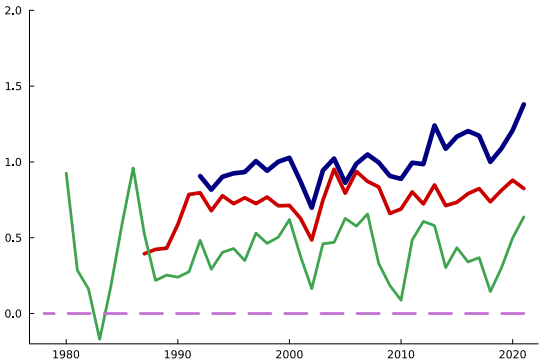


Log employment gap to entrants (age zero)

(a) Information

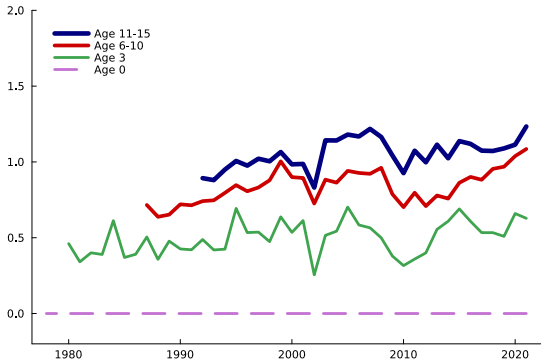


(b) Finance and Insurance

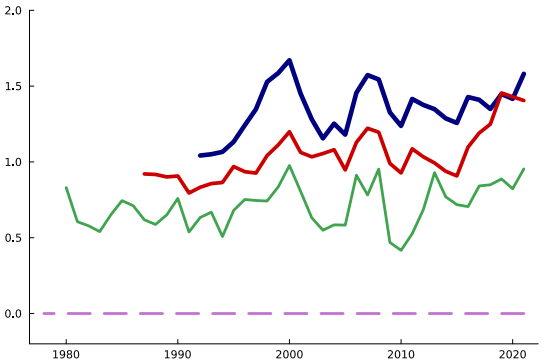


Log employment gap to entrants (age zero)

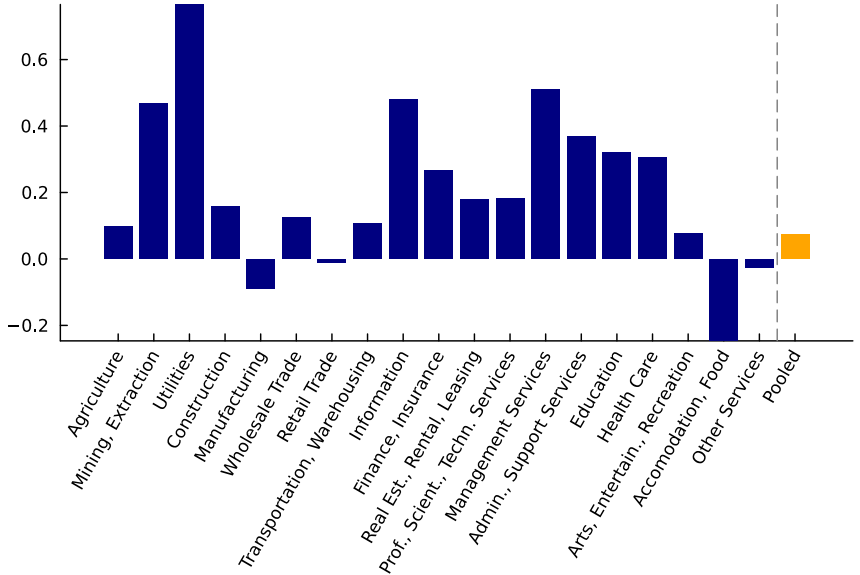
(a) Profess., Scient., and Techn. Services



(b) Administrative and Support Services



Log employment (age 11-15) gap to entrants, 1992–2017



Questions

At least two research questions arise naturally

- What is the (exogenous) cause behind the increase in relative firm size?
  - In response, do firms grow faster or has firm selection (by firm age) changed?
- What are the implications for the macroeconomy, in particular productivity growth?

Related literature

- Trends in firm size (growth)
  - Sterk, Sedlácek and Pugsley (2021), Karahan, Pugsley and Sahin (2022), Hopenhayn, Neira and Singhania (2022)
- Explaining recent macroeconomic trends
  - Davis (2017), Gutiérrez and Philippon (2018), Bloom, Jones, Van Reenen and Webb (2020), Liu, Mian and Sufi (2022), Olmstead-Rumsey (2022), Peters and Walsh (2022), Akcigit and Ates (2023), Aghion, Bergeaud, Boppart, Klenow and Li (2023), De Ridder (2024), ...
- Quantifying the sources of economic growth
  - Akcigit and Kerr (2018), Garcia-Macia, Hsieh and Klenow (2019), Peters (2020)
- Macroeconomic implications of reallocation
  - Restuccia and Rogerson (2008), Hsieh and Klenow (2009), Song, Storesletten and Zilibotti (2011), Acemoglu, Akcigit, Alp, Bloom and Kerr (2018)

Outline

Model

Explaining the changes in relative firm size across BGPs

Implications for the macroeconomy in the long run

Transition dynamics

Robustness and discussion

Outline

Model overview

The model features the following three elements

- Link b/w firm dynamics and economic growth in spirit of Schumpeterian growth models
- Two types of innovation: horizontal and vertical (internal) innovation
  - Internal innovation as a source of markup growth
  - Markup growth introduces a wedge between firm sales and employment growth
- Innate (ex-ante) heterogeneity in firm fundamentals (productivity)
  - Introduces heterogeneity in expected life cycle growth across firms
  - Allows changes in firm selection by age to explain the increase in relative firm size

Dynamic firm problem, high-productivity firm

Firm chooses its internal (vertical) and expansion (horizontal) R&D efforts (I_k,x_k)

$$r_t V_t^h(n, \boldsymbol{\mu}, S_t) - \dot{V}_t^h(n, \boldsymbol{\mu}, S_t) =$$

Dynamic firm problem, high-productivity firm

Firm chooses its internal (vertical) and expansion (horizontal) R&D efforts (l_k,x_k)

$$r_t V_t^h(n, \boldsymbol{\mu}, S_t) - \dot{V}_t^h(n, \boldsymbol{\mu}, S_t) =$$

$$\sum_{k=1}^{n} \underbrace{\pi(\mu_k)}_{\text{Flow profits}} +$$

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$$\sum_{k=1}^{n} \underbrace{\pi(\mu_k)}_{\text{Flow profits}} + \sum_{k=1}^{n} \underbrace{\tau_t \left[V_t^h \left(n-1, \boldsymbol{\mu}_{-k}, S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Agg. creative destruction}}$$

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$$+ \max_{[I_k, x_k]} \left\{ \sum_{k=1}^{n} \underbrace{I_k \left[V_t^h \left(n, \left[\boldsymbol{\mu}_{-k}, \mu_k \times \lambda \right], S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Internal R\&D}} \right.$$

Dynamic firm problem, high-productivity firm

Firm chooses its internal (vertical) and expansion (horizontal) R&D efforts (l_k,x_k)

$$
\begin{aligned}
r_t V_t^h(n, \boldsymbol{\mu}, S_t) - \dot{V}_t^h(n, \boldsymbol{\mu}, S_t) = \\
&\sum_{k=1}^{n} \underbrace{\pi(\mu_k)}_{\text{Flow profits}} + \sum_{k=1}^{n} \underbrace{\tau_t \left[V_t^h \left(n-1, \boldsymbol{\mu}_{-k}, S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Agg. creative destruction}} \\
&+ \max_{[l_k, x_k]} \left\{ \sum_{k=1}^{n} \underbrace{l_k \left[V_t^h \left(n, \left[\boldsymbol{\mu}_{-k}, \mu_k \times \lambda \right], S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Internal R\&D}} \right. \\
&+ \sum_{k=1}^{n} \underbrace{x_k \left[S_t V_t^h \left(n+1, [\boldsymbol{\mu}, \lambda], S_t \right) + (1 - S_t) V_t^h \left(n+1, \left[\boldsymbol{\mu}, \lambda \times \varphi^h / \varphi^\ell \right], S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Expansion R\&D}}
\end{aligned}
$$

S_t is the share of product lines operated by high-productivity firms

Dynamic firm problem, high-productivity firm

Firm chooses its internal (vertical) and expansion (horizontal) R&D efforts (I_k,x_k)

$$
\begin{aligned}
r_t V_t^h(n, \boldsymbol{\mu}, S_t) - \dot{V}_t^h(n, \boldsymbol{\mu}, S_t) = \\
&\sum_{k=1}^{n} \underbrace{\pi(\mu_k)}_{\text{Flow profits}} + \sum_{k=1}^{n} \underbrace{\tau_t \left[V_t^h \left(n-1, \boldsymbol{\mu}_{-k}, S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Agg. creative destruction}} \\
&+ \max_{[I_k, x_k]} \Bigg\{ \sum_{k=1}^{n} \underbrace{I_k \left[V_t^h \left(n, \left[\boldsymbol{\mu}_{-k}, \mu_k \times \lambda \right], S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Internal R\&D}} \\
&+ \sum_{k=1}^{n} \underbrace{x_k \left[S_t V_t^h \left(n+1, [\boldsymbol{\mu}, \lambda], S_t \right) + (1 - S_t) V_t^h \left(n+1, \left[\boldsymbol{\mu}, \lambda \times \varphi^h / \varphi^\ell \right], S_t \right) - V_t^h(n, \boldsymbol{\mu}, S_t) \right]}_{\text{Expansion R\&D}} \\
&- \underbrace{w_t \Gamma \left([I_i, x_i]; n, \boldsymbol{\mu} \right)}_{\text{R\&D costs}} \Bigg\}
\end{aligned}
$$

S_t is the share of product lines operated by high-productivity firms

Outline

Explaining the changes in relative firm size across BGPs

- What explains the changes in firm size relative to entry?
- Estimate the model on two BGPs
  - Initial BGP reflects firm size and macro-econ. conditions during the late 1990s
  - New BGP reflects the changes in relative firm size in 2010s
- Estimation points towards rising costs of firm entry and internal R&D
- Potential drivers of rising costs of firm entry and internal R&D
  - Rising sector-level stock of fixed assets (e.g. IPP, structures) increased startup costs
  - Goods-producing firms increasingly offer (less patentable) services
    - Harder to distance competitors along the quality space

Decomposing relative firm size into within-firm growth and firm selection

$$E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = a_f\right] - E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0\right] =$$

$$s^h(a_f) \times \underbrace{\left(E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = a_f, \varphi_f = \varphi^h\right] - E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0, \varphi_f = \varphi^h\right]\right)}_{\text{Within-firm growth (high productivity)}}$$

$$+ \left(1 - s^h(a_f)\right) \times \underbrace{\left(E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = a_f, \varphi_f = \varphi^\ell\right] - E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0, \varphi_f = \varphi^\ell\right]\right)}_{\text{Within-firm growth (low productivity)}}$$

$$+ \left(s^h(a_f) - s^h(0)\right) \times \underbrace{\left(E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0, \varphi_f = \varphi^h\right] - E\left[\ln \text{Size}_{f,t} | \text{Age}_{f,t} = 0, \varphi_f = \varphi^\ell\right]\right)}_{\text{Firm exit correction term}}$$

where $s^h(a_f)$ denotes the share of high-productivity firms among firms of age a_f (selection).

Within-firm growth over the firm's first eight years

	Initial BGP (logs)	New BGP (logs)
Sales (high productivity)	0.625	0.792
Sales (low productivity)	0.370	0.317

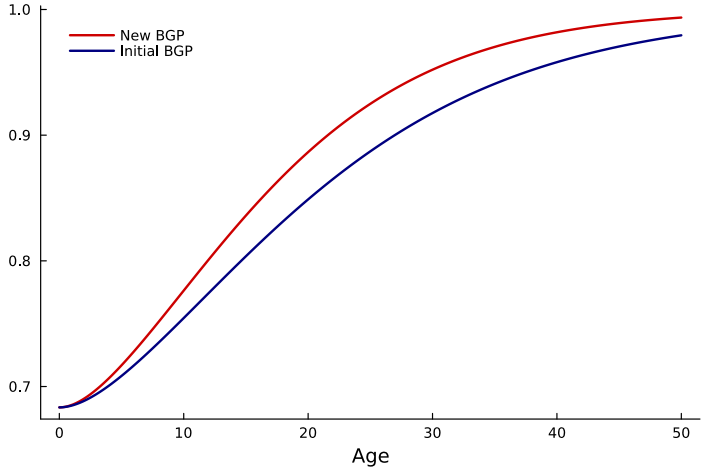
- Sales of high-productivity firms grow faster, that of low-productivity firms slower

Within-firm growth over the firm's first eight years

	Initial BGP (logs)	New BGP (logs)
Sales (high productivity)	0.625	0.792
Sales (low productivity)	0.370	0.317
Employment (high productivity)	0.357	0.585
Employment (low productivity)	0.096	0.106

- Sales of high-productivity firms grow faster, that of low-productivity firms slower
- Employment of high-productivity firms grow faster
- Within-firm growth of high-productivity firms accelerated

Share of high-productivity firms among firms of age a_f



- Positive selection conditional on firm age

Outline

Implications for the macroeconomy in the long run

	Initial BGP (in %)	ΔBGPs
Entry rate	14.3	-8.1pp.
Concentration, S	80.6	+17.1pp.
Agg. growth rate, g	3.02	-0.6pp.
Avg. productivity, $\left(\varphi^h/\varphi^\ell\right)^{S_{new}-S_{initial}}$		+1.5%

Notes: Initial BGP shows levels, ΔBGPs shows changes in percentage points (pp) or in percent wrt. to the initial BGP.

- Firm entry falls, concentration rises, and the aggregate growth rate declines
- Fall in the entry rate (agg. growth rate) accounts for 80% (60%) of that in the data
- Positive selection of firms increases average productivity. Change in welfare ambiguous
- $S\uparrow$ aligns with Kehrig & Vincent (2021), Baqaee & Farhi (2020), De Loecker et al. (2020)

Implications for long-run productivity growth

- Write the agg. growth rate g as

$$g = Sg^h + (1-S)g^\ell + g^z,$$

where $g^h \equiv (I + x^h)\ln(\lambda)$, $g^\ell \equiv (I + x^\ell)\ln(\lambda)$ and $g^z \equiv z\ln(\lambda)$.

- Shift-share decomposition of $\Delta g \equiv g_{new} - g_{old}$

$$\Delta g = \underbrace{S_{old}\Delta g^h + (1-S_{old})\Delta g^\ell}_{\Delta\text{Within}} + \underbrace{g^h_{old}\Delta S - g^\ell_{old}\Delta S}_{\Delta\text{Between}} + \underbrace{\Delta g^h \Delta S - \Delta g^\ell \Delta S}_{\Delta\text{Cross}} + \underbrace{\Delta g^z}_{\Delta\text{Entry}}$$

  - ΔWithin: changes in incumbents' innovation rates
  - ΔReallocation = ΔBetween + ΔCross: reallocation across productivity types
  - ΔEntry: changes in the entry rate

Implications for long-run productivity growth

	Δg (in pp.)
ΔWithin	+0.22
ΔReallocation	+0.27
ΔEntry	-1.10
Total	-0.62

- Incumbents' average innovation rates increased
  - More productive firms growing faster outweighs less productive ones growing slower
- Reallocation of sales shares increased the long-run growth rate (positive selection)
  - Reallocation effects absent with ex-ante homogeneous firms
- Falling firm entry dominates the positive contributions by incumbents

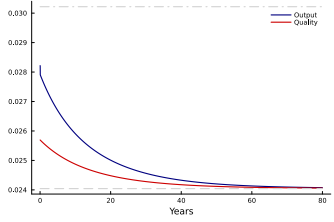
Outline

Transition dynamics

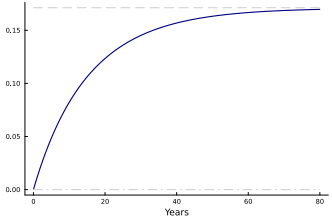
- Economy converges to a new BGP with a lower *growth rate* of aggregate productivity
- Reallocation to more productive incumbents increases the productivity *level*
- Opposing level and growth effects on aggregate productivity
- What are the welfare effects associated with the changes in relative firm size?

Transition dynamics

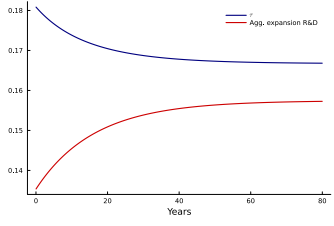
(a) Output and quality growth



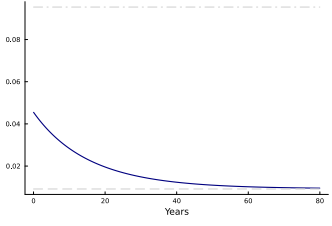
(b) Change in concentration, $S_t - S_{\text{initial}}$



(c) Rate of creative destruction, τ_t



(d) Rate of entry, z_t



Welfare effects

- Perm. consumption change that yields indifference b/w initial and transition to new BGP
- Transition to new BGP equivalent to permanent 23.3% consumption loss in initial BGP
- Welfare loss sizable
  - Caveat: interpreted high-growth period of late 1990s as initial BGP
  - Transition is quick and no further burst in growth (consistent with data)

Outline

Robustness and discussion

- Firm size regressions, alternative specifications
- Model fit
- Alternative explanations for the change in relative firm size
- Evidence on rising entry and internal R&D costs
- Firm productivity and within-firm growth in the data

Conclusion

- Firm size conditional on age has increased relative to the size at entry
- Build a structural model of firm dynamics with ex-ante heterogeneous firms
- Rising entry and internal R&D costs rationalize the increase in relative firm size
- Cost changes favor the expansion of ex-ante more productive firms
  - $\Longrightarrow$ More productive firms grow faster, less productive ones slower
  - $\Longrightarrow$ More productive firms are more likely to survive, less productive ones exit earlier
- Positive growth and selection effects by incumbents are outweighed by falling firm entry

– Backup Slides –

Data

- Universe of Swedish firms 1997–2017
- Information from balance sheets and profit and loss statements
- Restrict to firms in the private economy with at least one employee
- Birth year defined as year when firm hires its first employee

Data: summary statistics

	25th Pct.	50th Pct.	75th Pct.	Mean	SD	Obs.
*Sales**	1.2	2.7	7.8	27.8	568.2	4,918,996
*Value added**	0.5	1.1	2.9	7.6	142.3	4,918,996
Employment	1	2	5	9.9	131.1	4,918,996
*Wage bill**	0.2	0.6	1.6	3.7	53.0	4,918,996
*Capital stock**	0.04	0.2	1.1	9.3	277.0	4,918,996
*Intermediate Inputs**	0.4	0.9	2.6	10.8	270.0	4,918,996

Note: variables marked with * are in units of million 2017-SEK (1 SEK $\approx$ 0.1 US dollars). The capital stock is defined as fixed assets minus depreciation.

Balanced growth path definition

Definition

A balanced growth path (BGP) is a set of allocations $[x_{it}, I_{it}, \ell_{it}, z_t, S_t, y_{it}, C_t]_{it}$ and prices $[r_t, w_t, p_{it}]_{it}$ such that firms choose $[x_{it}, I_{it}, p_{it}]$ optimally, the representative household maximizes utility choosing $[C_t, y_{it}]_{it}$, the growth rate of aggregate variables is constant, the free-entry condition holds, all markets clear and the distribution of quality and productivity gaps is stationary.

Back

Characterization of firm dynamics

- Life cycle of markups (high and low productivity firms)

$$E\left[\mu_f^h | \text{firm age} = a_f, \varphi^h\right] = \underbrace{\ln\lambda \times \left(1 + I \times E[a_P^h | a_f]\right)}_{\text{Quality improvements}} + \underbrace{(1-S) \times \ln\left(\varphi^h/\varphi^\ell\right)}_{\text{Productivity advantage}}$$

$$E\left[\mu_f^l | \text{firm age} = a_f, \varphi^\ell\right] = \underbrace{\ln\lambda \times \left(1 + I \times E[a_P^\ell | a_f]\right)}_{\text{Quality improvements}} + \underbrace{S \times \ln\left(\varphi^\ell/\varphi^h\right)}_{\text{Productivity disadvantage}}$$

- Sales growth productivity type $f \in \{h, \ell\}$

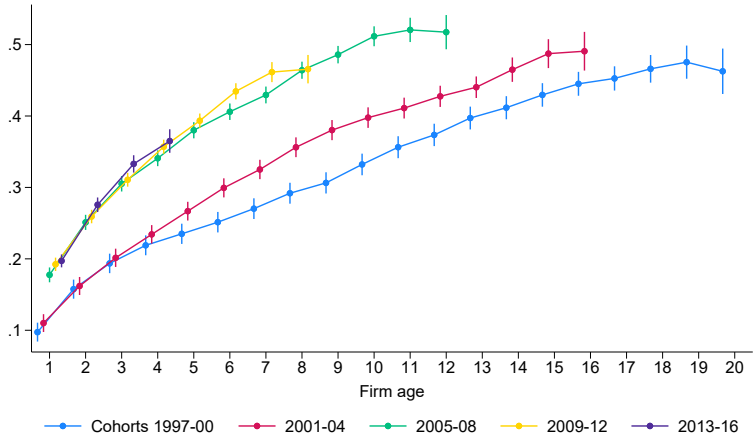
$$E\left[\ln npy | a_f, \varphi^f\right] - E\left[\ln npy | 0, \varphi^f\right] = \underbrace{g \times a_f}_{\text{Aggregate growth}} + \underbrace{\sum_{n=1}^{\infty} \ln n \times p^f(n|a_f)}_{\text{Firm's product growth}}$$

- Employment growth productivity type $f \in \{h, l\}$

$$E[\ln l_f | a_f, \varphi^f] - E[\ln l_f | 0, \varphi^f] = \underbrace{E\left[\ln n | a_f, \varphi^f\right]}_{\text{Firm's product growth}} - \underbrace{\left(E\left[\ln \mu_f | a_f, \varphi^f\right] - E\left[\ln \mu_f | 0, \varphi^f\right]\right)}_{\text{Firm's markup growth}}$$

Back

Firm size regressions, cohort × industry fixed effects



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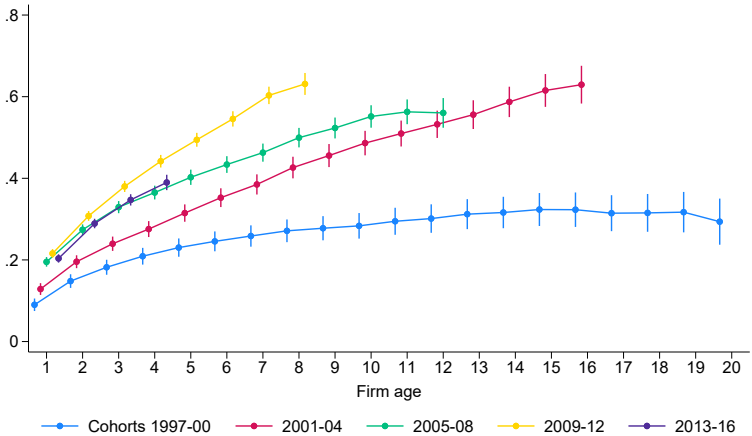
Firm size regressions, year × industry fixed effects



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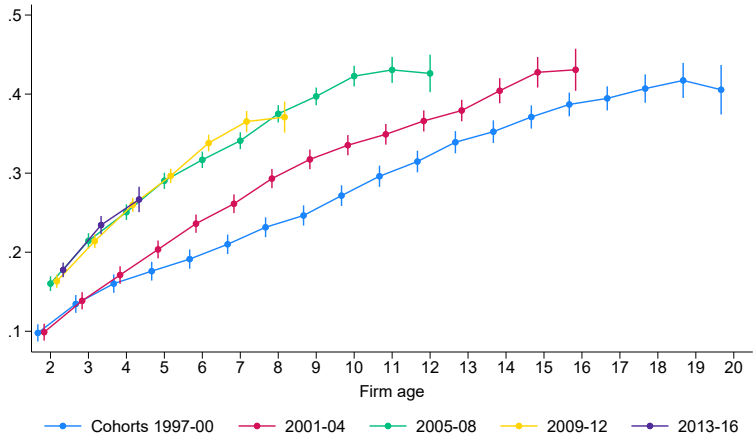
Firm size regressions, log employment relative to age < 2



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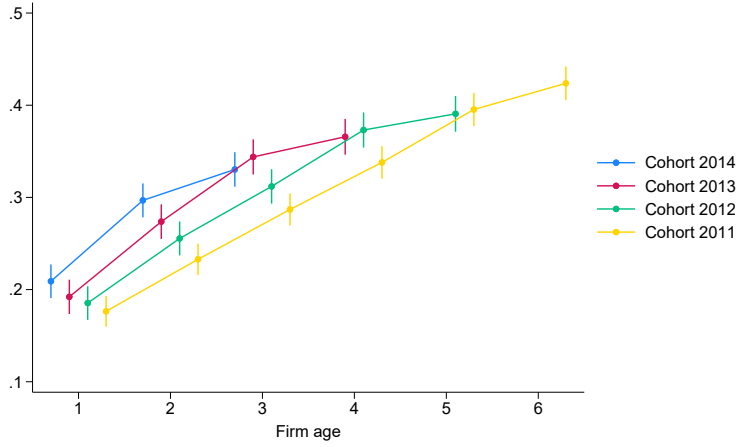
Firm size regressions, post Great Recession



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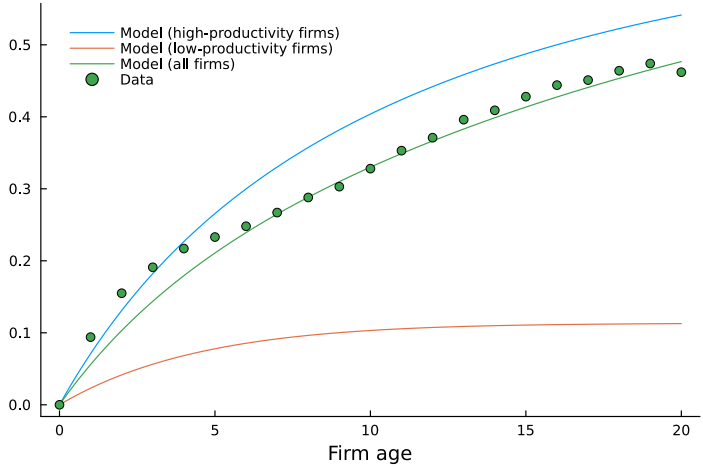
Fit of relative firm size



Notes: graph shows the employment life cycle growth in the model (initial BGP) and data (cohorts 1997–2000).

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Rising productivity gaps

- Aghion et al. (2023): $\varphi^h/\varphi^\ell \uparrow$ as a driver behind rising concentration and falling growth
- Estimate alternative new BGP where φ^h/φ^ℓ (instead of ψ_z) and ψ_I are subject to change
- Estimated fall in internal R&D efficiency almost identical to before (-54% vs. -51%)
- Increase in productivity gap *qualitatively* consistent with changes in firm growth

	ΔData (pp)	ΔModel (pp)
Moments		
Sales growth by age 8 (cohorts 2009–2012)	+11.5	+2.1
Employment growth by age 8 (cohorts 2009–2012)	+17.8	+7.4
Parameters		
ψ_I *Internal R&D efficiency* (Δ in %)		-54
φ^h/φ^ℓ *Productivity gap* (Δ in %)		+6

Rising productivity gaps

- Long-run macroeconomic implications in line with recent trends
  - The aggregate growth rate g falls by 0.49pp (0.42pp in Aghion et al., 2023)
  - The entry rate falls by 3pp
  - Concentration S rises
- Decomposing the fall in the growth rate g as before

	$\psi_I \downarrow, \varphi^h/\varphi^\ell \uparrow$	$\psi_I \downarrow$	$\varphi^h/\varphi^\ell \uparrow$
ΔWithin	-0.13	-0.24	+0.11
ΔReallocation	+0.18	+0.01	+0.13
ΔEntry	-0.53	-0.12	-0.35
Δg (in pp.)	-0.49	-0.35	-0.11

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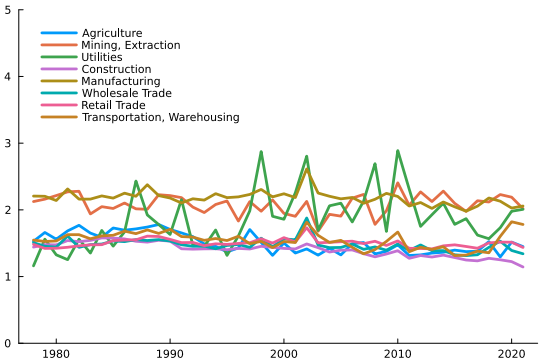
Selection among entrants

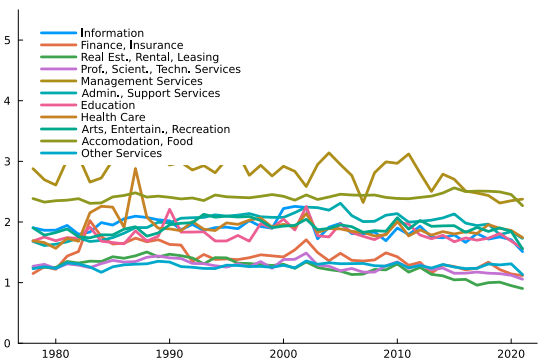
- Selection among entrants instead of incumbents
- Acceleration of firm size growth could be due to more productive firms entering
- Equivalent to increase in p^h
- Selection of productivity types should be reflected in employment of entrants
- Employment of entrants has been relatively stable in U.S. Census data
- Suggests that there are no systematic changes in the types of entrants

Selection among entrants

(a) Goods



(b) Services



Notes: average log employment of entrants in U.S. Census data.

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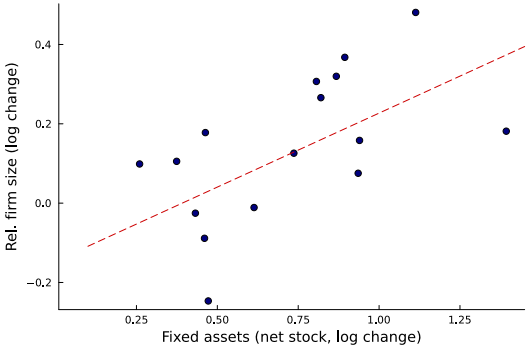
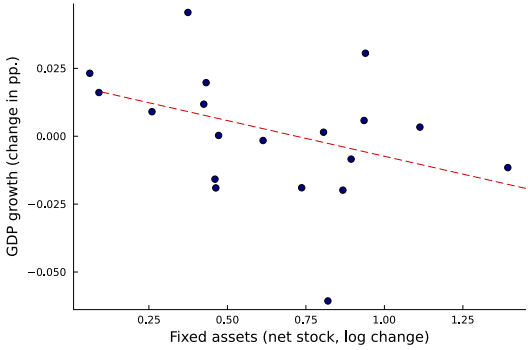
Potential causes behind rising entry costs

- Rising stock of fixed assets (e.g. IPP, structures) increases the cost of firm startups
  - Relative firm size increased the most in U.S. sectors with largest rise in fixed assets
  - Sectors with largest rise in fixed assets experienced greatest decline in GDP growth





- Rising complexity of regulatory requirements and tax systems, lobbying expenditures

Davis (2017), Gutiérrez and Philippon (2018)

Potential causes behind rising internal R&D costs

- Structural transformation to service economy
  - Swedish manufacturing firms increasingly offer services
    - Volvo offering car maintenance, insurance, leasing, car sharing
    - H&M offering clothing repair and recycling, clothing rentals ...
    - Agg. level: workforce employed in services from 72% to 79% (1997–2012)
  - Harder to distance competitor within product markets in services than manufacturing
- Falling R&D output relative to R&D inputs in the U.S. (Bloom et al., 2020)
  - Model points to rising internal rather than expansion R&D costs
    - $\varphi_I \downarrow$ consistent with trends in firm growth
    - $\varphi_x \downarrow$ would counterfactually slow firm growth and reduce concentration

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Firm productivity and within-firm growth in the data

- Permanently more productive firms choose higher expansion R&D rates
  - Firm life cycle trajectories determined by ex-ante factors (Sterk et al., 2021)
- Model suggests that firm's productivity type is captured by the markup at entry
- Test relation between firm's productivity and firm growth in the data

$$\ln \text{Size}_{\text{Age}_{f,t}=a_f} - \ln \text{Size}_{\text{Age}_{f,t}=0} = \beta_0 + \beta_1 \log \left(\frac{py}{wl} \right)_{\text{Age}_{f,t}=0} + \theta_c + \theta_k + \epsilon_{f,t}$$

- Focus on balanced panel of firms that survive until age a_f
- β_1 captures the effect of firm productivity on within-firm growth

Firm productivity and within-firm growth in the data

	Δ ln Size$_{\text{Age=8}}$	Δ ln Size$_{\text{Age=8}}$	Δ ln Size$_{\text{Age=8}}$	Δ ln Size$_{\text{Age=8}}$
$\log\left(\frac{py}{wl}\right)_{\text{Age=0}}$	0.130	0.198	0.222	0.237
	(0.006)	(0.005)	(0.005)	(0.006)
$\log K_{\text{Age=0}}$			-0.041	0.003
			(0.003)	(0.003)
$\log M_{\text{Age=0}}$				-0.107
				(0.004)
Cohort fixed effects	✓	✓	✓	✓
Industry fixed effects	✓	✓	✓	✓
$\log\left(\frac{py}{wl}\right)_{\text{Age=0}} > 0$		✓	✓	✓
N	66,817	65,875	60,950	60,832
R^2	0.06	0.08	0.08	0.10

1% more productive firms associated with 0.24pp faster size growth over first 8 years

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