The Development of the American Entrepreneurial Economy

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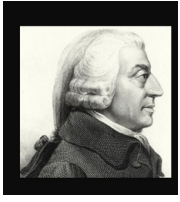
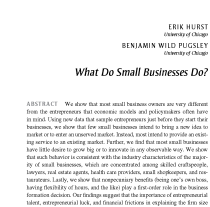
Entrepreneurship is assumed to be at the core of economic efficiency and economic growth

For economic efficiency:
local / main street entrepreneurship



Adam Smith



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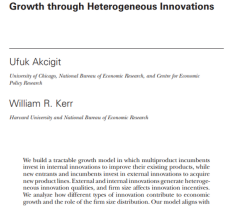
What Do Small Businesses Do?

ABSTRACT We show that most small business owners are very different from the entrepreneurs that economic models and policymakers often have in mind. Using new data that sample entrepreneurs just before they start their businesses, we show that few small businesses intend to bring a new idea to market or to enter an unserved market. Instead, most intend to provide an existing service to an existing market. Further, we find that most small businesses have little desire to grow big or to innovate in any observable way. We show that such behavior is consistent with the industry characteristics of the majority of small businesses, which are concentrated among skilled craftspeople, lawyers, real estate agents, health care providers, small shopkeepers, and restaurateurs. Lastly, we show that nonpecuniary benefits (being one's own boss, having flexibility of hours, and the like) play a first-order role in the business formation decision. Our findings suggest that the importance of entrepreneurial talent, entrepreneurial luck, and financial frictions in explaining the firm size distribution may be overstated. We conclude by discussing the potential policy implications of our findings.

For translating innovations into growth:
high growth entrepreneurship

Schumpeter



Growth through Heterogeneous Innovations

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We build a tractable growth model in which multiproduct incumbents invest in internal innovations to improve their existing products, while new entrants and incumbents invest in external innovations to acquire new product lines. External and internal innovations generate heterogeneous innovation qualities, and firm size affects innovation incentives. We analyze how different types of innovation contribute to economic growth and the role of the firm size distribution. Our model aligns with many observed empirical regularities, and we quantify our framework with Census Bureau and patent data for US firms. Internal innovation scales moderately faster with firm size than external innovation.

"The butcher, the baker, or the brewer"

Nowhere do people think this link is more true than in the U.S.

As to whatever may depend on enterprise, we need not fear to be outdone by any people on earth. It may almost be said that enterprise is our element.

—Alexander Hamilton, 1795

- New firms are responsible for about 20 percent of gross job creation in the U.S. today (Haltiwanger et al. 2013, Decker et al. 2014)

Yet, although economic growth is by definition a long-run phenomenon... We have almost no systematic evidence on aggregate entrepreneurship before ca. 1980

- VentureXpert (1970s), US Census LBD (1977), Startup Cartography Project (1988), NETS (1989), Crunchbase (2003)

Prior research provides a mosaic of important facts, individually and collectively insightful

- We have insight into historical entrepreneurship in specific regions and industries
  - e.g., Lamoreaux et al. 2004 (Cleveland) or Atack and Margo 2019 (blacksmiths)
- Lamoreaux, Sokoloff, Khan, Nicholas, and others have provided foundational insights into historical technological entrepreneurs (independent inventors), and the emergence of the American market for ideas

But prior work has left broader questions unanswered

The most basic question:
Has the rate of new firm creation increased or decreased across U.S. history?

More broadly: *What was the level and nature of historical entrepreneurship? How did it change over time, and why? Is entrepreneurship more or less important to the U.S. economy now than it was in the past?*

Most importantly:
What generalizable insights does this history offer today?

This gap in the literature also reflects a directional change in economic history as a field long ago

Entrepreneurship used to be a subject of more study in economic history

- Arthur H. Cole (yes, that one) founded and ran the Harvard Research Center in Entrepreneurial History until retiring in 1958
  - Schumpeter was a participant. Also were many graduate students and scholars we recognize, like Chandler, Landes, Rosovsky, Gerschenkron.
- *EEH* used to be *Explorations in Entrepeneurial History*

What we do in this paper

1. We introduce **novel, comprehensive data** on historical U.S. entrepreneurship in the form of business registrations (Andrews et al. 2022)—which measure the creation of new legal entities directly from administrative records

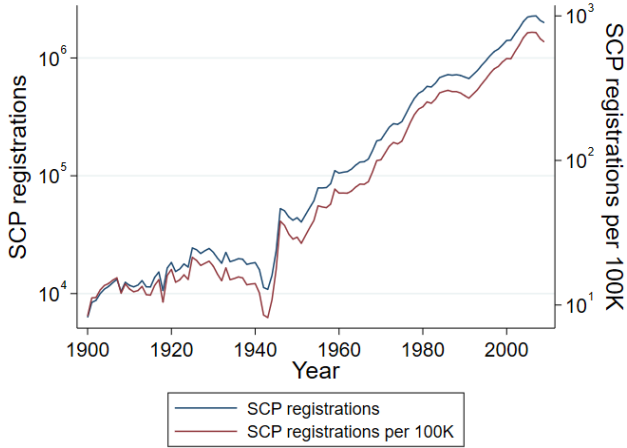
2. We use these data to document **long-run patterns** in U.S. firm creation
   - New facts about long-run entrepreneurship
   - Comparisons to other series like GDP, CBP establishments

3. We connect **innovation** to firm creation, in the Schumpeterian tradition
   - New (old) views of the role of entrepreneurs in driving economic growth
   - Ideas for they fit into traditional models (Aghion and Howitt 1992)

Summary of what we will show today

1. The rate of firm creation has increased significantly over the past 100 years, and World War II specifically marks a trend break: firm creation takes off
   - Entrepreneurial dynamism is *not* a fundamental constant of U.S. history: sustained growth in entrepreneurship is a post-war phenomenon

Business registrations, levels and per capita, 1900-2009



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   - *Manufacturing* and *Mining* $\downarrow$, *Services* and *Construction* $\uparrow$

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2. Composition of new firms changed significantly over time
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3. Entrepreneurship has become increasingly connected to technological change
   - The vast majority is not by technology producers, but rather by "Main Street" firms that identify and exploit market opportunities that innovation creates

Technology-enabled Entrepreneurship

Hurst vs. Gordon. Are plumbers mundane? Or part of the revolution?

- The millions of small businesses that don't seek to grow are instrumental to realizing the full value of innovation and transforming it into productivity growth
- Plumbers, HVAC installation and maintenance, gas stations, computer repair shops, one-hour photo developers, video rental stores, etc.

This is a departure from the now-ubiquitous view (in economics and beyond) of entrepreneurs as the marshals of creative destruction

- Endogenous growth traditionally writes off these firms, focusing on high-growth, innovative startups as the force behind aggregate productivity growth

Technology-enabled Entrepreneurship

Not a new idea. Schumpeter (1942) *also* writes:
"[T]he function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention, or, more generally, an untried technological possibility for producing a new commodity, or producing an old one in a new way," and that "[this] function does not essentially consist in either inventing anything or otherwise creating the conditions which the enterprise exploits."

We argue that local entrepreneurs should have a larger role in how economists conceptualize endogenous growth than they currently do, and propose a specific view of these firms as diffusers of innovation.

Outline for the rest of this talk

1. What do we know about long-run U.S. entrepreneurship?
2. How we measure historical firm creation
3. Entrepreneurship since 1900: New facts
4. Entrepreneurship and innovation
5. Insights for endogenous growth and beyond

Roadmap

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Early literature

- Schumpeter, Cole, Baumol, others: entrepreneurship is a key determinant of national economic performance. Business model innovation and imitation as important as technological innovation.

- Evans (NBER 1948): first systematic empirical study
  - Describes evolution of legal environment for business creation
  - Documents business registrations from 16 states, 1875-1943
  - "a reading of the mere names of the newly chartered companies [can] indicate the nature of a wave of entrepreneurial activity ... be it the mania for skating rinks or Tom-Thumb golf courses or the feverish organization of trusts"

Recent literature

- Research on historical (pre-1940) entrepreneurship good but focused
  - Technological entrepreneurship (Lamoreaux, Sokoloff, Khan, Nicholas, etc.)
- Research on modern (post-1980) entrepreneurship better-developed
  - Aggregate amount and changes over time (Haltiwanger, Jarmin, Miranda 2013; Decker and Haltiwanger 2014, Foster et al. 2018)
  - Type (Hamilton 2000, Hurst and Pugsley 2011, Guzman and Stern 2019)
  - And economic growth (Aghion and Howitt 1992, Klette and Kortum 2004, Lentz and Mortensen 2008, Akcigit and Kerr 2018)

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Modern data sources inadequate for our goals in this paper

- Administrative data like Census Bureau LBD, IRS, etc.
  - Cover all *tax-paying employer firms* by year
  - Begins in 1977; restricted-use
- VentureXpert, Venture Source, Preqin, CB Insights, Crunchbase
  - Only measure select subset of startups that receive private investment
  - Poor coverage prior to 1990s
- Commercial databases like Dun & Bradstreet, NETS, Infogroup:
  - Electronic data only ca. 1970

Historical data sources inadequate for our goals in this paper

- Decennial census and CPS: both measure the self-employed population
  - Stock, not flow. Self-employment $\neq$ entrepreneurship.
- Patent data: technological entrepreneurs as inventors of unassigned patents
  - Sizeable subliterature on this population that has some really great work (e.g., Lamoreaux and Sokoloff 1999b,a, Nicholas 2003, 2010, Babina et al. 2020)
  - In some cases, authors go the extra step of explicitly linking inventors to new businesses (e.g., Khan and Sokoloff 1993, Lamoreaux and Sokoloff 2005)
  - But it covers only a small, distinctive subset of historical entrepreneurship

We measure firm creation via business registrations

Data from the Startup Cartography Project (Andrews et al. 2022): an effort to collect business registration data from all 50 U.S. states (and DC)

- Administrative public records of state Secretary of State offices
- Received data from 1900+ from nearly all states

What is a business registration?

- The act of creating a new partnership, corporation, or (since 1993) LLC
- Represent the legal founding of a company or organization

Example: NBER registration, in New York state, 1920

Entity Details

ENTITY NAME: NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

DOS ID: 15564

FOREIGN LEGAL NAME:

FICTITIOUS NAME:

ENTITY TYPE: DOMESTIC NOT-FOR-PROFIT CORPORATION

DURATION DATE/LATEST DATE OF DISSOLUTION:

SECTIONOF LAW: -

ENTITY STATUS: ACTIVE

DATE OF INITIAL DOS FILING: 01/29/1920

REASON FOR STATUS:

EFFECTIVE DATE INITIAL FILING: 01/29/1920

INACTIVE DATE:

FOREIGN FORMATION DATE:

STATEMENT STATUS: NOT REQUIRED

COUNTY: NEW YORK

NEXT STATEMENT DUE DATE:

JURISDICTION: NEW YORK, UNITED STATES

NFP CATEGORY: CHARITABLE

Simple history of incorporation law

- Prior to 1900, incorporation was tightly controlled by the state (pre-American Revolution, by England; later, by state governments)
- Incorporation opened up in late 1800s, quickly expanding to all states

Simple history of incorporation law

- Prior to 1900, incorporation was tightly controlled by the state (pre-American Revolution, by England; later, by state governments)
- Incorporation opened up in late 1800s, quickly expanding to all states
- By ca. 1915, two common features of business incorporation across the U.S.:
  1. All states allowed general (i.e., open) incorporation
  2. Firms in every state could choose legal jurisdiction different from HQ
     - Local state law: advantages new firms operating in the state
     - DE: beneficial for firms that engage in business across states or intend to list on the stock market. Reflects growth intentions (Guzman and Stern 2020).

Business registration data

- For each firm, we focus on four variables:
  - Firm name, state, incorporation year, whether Delaware-registered
- How much can be learned from just these four things?
  - What's in a name? (hint: much more than Shakespeare thought!)
  - Answer: Tadelis (1999), McDevitt (2014), Belenzon et al. (2017)
  - Can often infer line of business ("National Bureau of Economic Research")
  - Examples words in firm names: "Service", "Construction", "Shop"

Pros and Cons

Advantages of focusing on new legal entities:

- Anchoring moment in firm formation that maps naturally to a definition of entrepreneurship: the moment a business idea gets translated into an independent organization tasked with executing on it
- Consistent definition we can apply over our entire sample

The major limitations, as we see them, are two:

- Data do not include firms' industry or business characteristics
- Specifically measure the creation of legal entities, and do not include unincorporated sole proprietors

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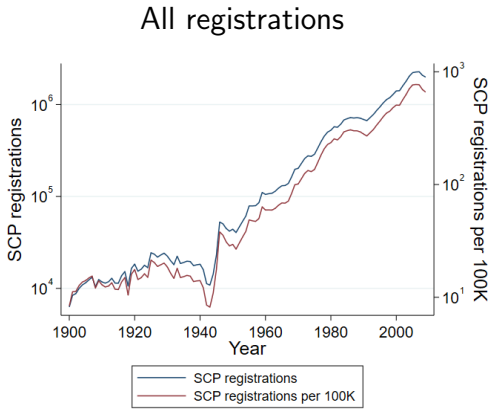
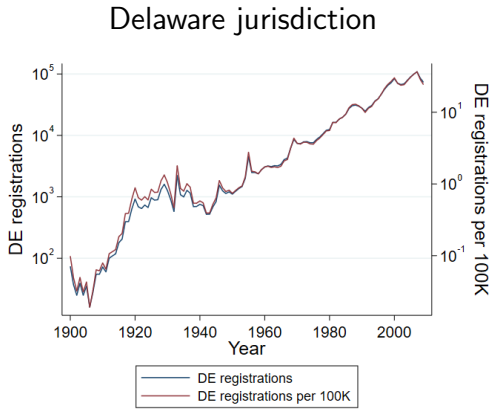
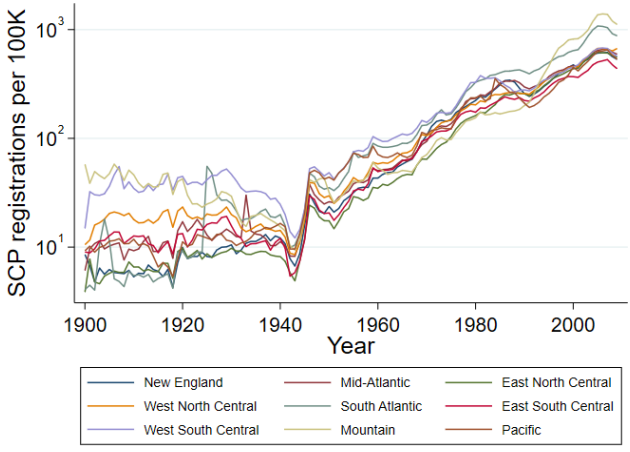


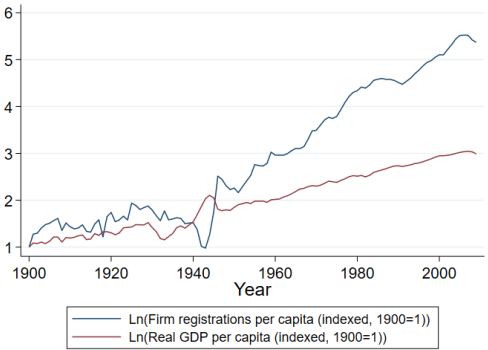


Business registrations per 100,000 population, by census division



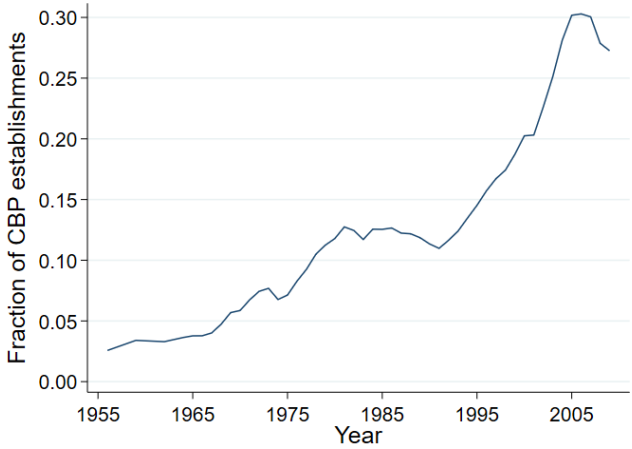
Growth of per-capita firm registrations vs. GDP

Business registrations and GDP per capita, 1900-2009 (log values; indexed; 1900 = 1)



	Average growth rate		
	1900-1929	1946-2009	1900-2009
Registrations p.c.	0.018	0.055	0.043
	(0.002)	(0.001)	(0.001)
Real GDP p.c.	0.015	0.021	0.020
	(0.002)	(0.001)	(0.001)
R^2	0.78	0.99	0.93
Difference (p-val)	0.271	0.000	0.000

Business registrations as a share of CBP, 1956-2009



What industries are increasing and decreasing over time?

There is no systematic measure of industry in firm registrations

But: might there be information in firm names?

- We conjecture we can reasonably approximate industrial sectors

Our conceptual approach:

1. Begin with a dataset that measures firms and their sectors
2. Use the distribution of firm names across sectors to quantify the association of specific words with each sector
3. Use word sector scores to infer any given firm's sector

We classify firms into 10 sectors

1. Agriculture, Forestry, & Fishing
2. Construction
3. Finance, Insurance, & Real Estate
4. Manufacturing
5. Mining
6. Public Administration
7. Retail Trade
8. Services
9. Transportation & Public Utilities
10. Wholesale Trade

Our specific approach

dun & bradstreet

- Using firm samples from Dun & Bradstreet for 1970, 1980, 1990, we:
  - Retrieve firm names, SIC codes, states, and reported founding years
  - Crosswalk SICs to 10 high-level economic sectors
  - Clean firm names of person names, place names, stop words, etc.
  - Calculate remaining tokens' sector distribution ("sector scores")
  - Aggregate tokens in firm names and average sector scores

- This returns a probability that each firm is in each sector
  - Alternative interpretation: the firm's association with each sector—a flexible classification that permits sectoral boundary spanning

Example: "ANDERSON HOME APPLIANCES"

	Token-sector scores and cross-token averages				
Word	Agriculture	Construction	Fin./Ins./RE	Retail Trade	Services
Anderson					
Home					
Appliances					
Average					

Example: "ANDERSON HOME APPLIANCES"

	Token-sector scores and cross-token averages				
Word	Agriculture	Construction	Fin./Ins./RE	Retail Trade	Services
Anderson Home Appliances	8%	17%	10%	14%	34%
Average					

Example: "ANDERSON HOME APPLIANCES"

	Token-sector scores and cross-token averages				
Word	Agriculture	Construction	Fin./Ins./RE	Retail Trade	Services
Anderson	8%	17%	10%	14%	34%
Home	0%	20%	10%	17%	48%
Appliances					
Average					

Example: "ANDERSON HOME APPLIANCES"

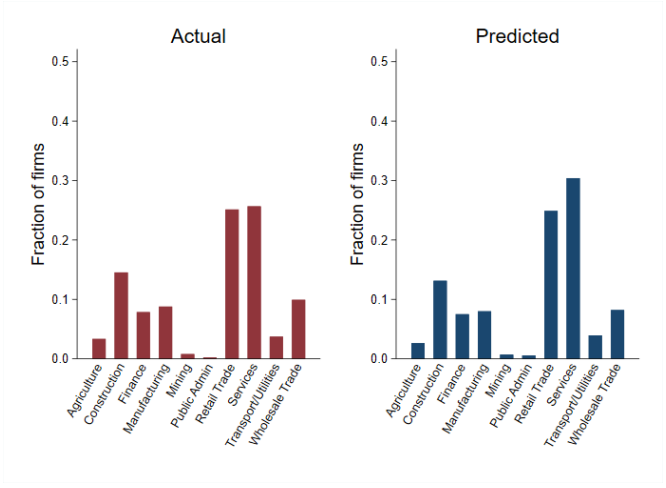
	Token-sector scores and cross-token averages				
Word	Agriculture	Construction	Fin./Ins./RE	Retail Trade	Services
Anderson	8%	17%	10%	14%	34%
Home	0%	20%	10%	17%	48%
Appliances	0%	2%	0%	71%	21%
Average					

Example: "ANDERSON HOME APPLIANCES"

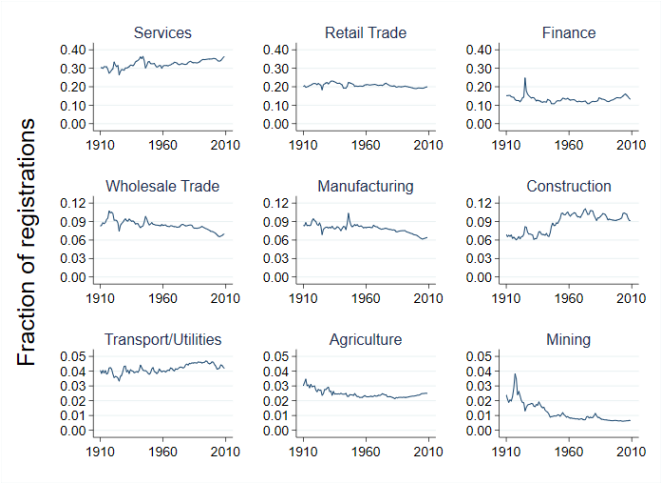
	Token-sector scores and cross-token averages				
Word	Agriculture	Construction	Fin./Ins./RE	Retail Trade	Services
Anderson	8%	17%	10%	14%	34%
Home	0%	20%	10%	17%	48%
Appliances	0%	2%	0%	71%	21%
Average	3%	13%	7%	34%	34%

- Actual top 1 & 2 sectors in D&B: *Services* + *Retail Trade*
  - But we might think it's a little bit construction, too

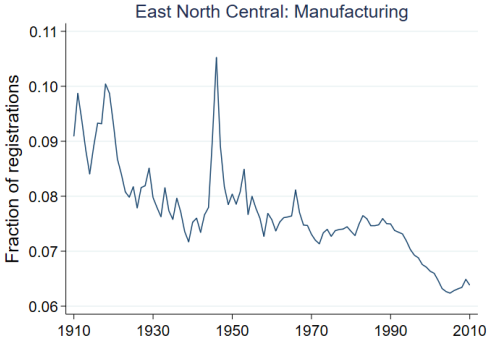
Validation: Predicted vs. actual distribution in test sample

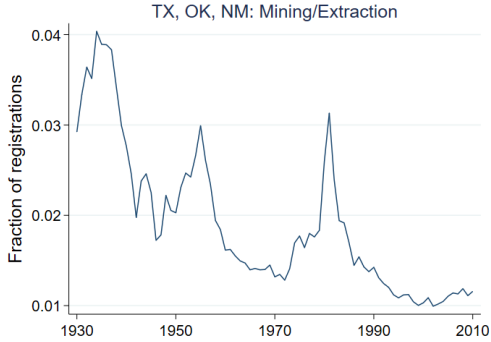


Sector shares of business registrations, 1910-2009



Regional patterns in *Manufacturing* and *Mining/Extraction*





Initial insights

- Evidence challenges view that U.S. has always been a nation of entrepreneurs
  - In comparison to the postwar period, entrepreneurship in the early twentieth century was feeble or stymied. Since WW2, very robust.
- Entrepreneurship illustrates (and perhaps drives) the structural transformation of the U.S. economy across the 20th century
  - *Manufacturing* and *Mining* share $\downarrow$, and *Services* share $\uparrow$, as U.S. evolved from extractive, to industrial, to post-industrial
- Interesting shocks not previously documented in startup activity

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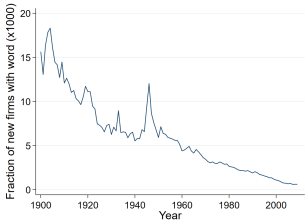
Puzzle: Why did entrepreneurship accelerate after WW2?

- Did technological innovation change the returns to scale which characterized American business over the prior century (Chandler 1990)?
- Did population movements and changes in economic geography unlock new entrepreneurial opportunities?
- Did regulatory changes favoring small businesses change the relative profitability of entrepreneurship?
- Did small business lending grow?
- (Many more questions could be imagined)

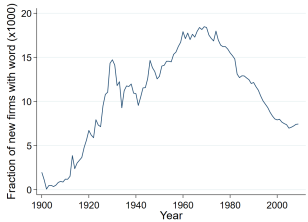
Our focus: Entrepreneurship and innovation

Frequency of select words in firm names, 1900-2009:

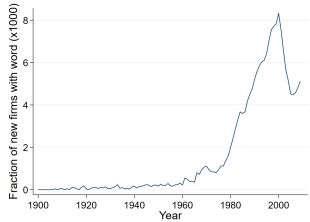
"Manufacturing"



"Service"



"Technology"



What we will show you next:

1. We can measure the emergence of new types of businesses, and the creation of new businesses around technological innovation, through firm names
2. The level and speed with which innovation diffuses into entrepreneurship has increased over time, especially in the postwar period
3. The vast majority of these firms are workaday local entrepreneurs
   - The exploiters, not the explorers

Most common words in firm names, by decade

Most common words in new firm names, by decade

Rank	1900s	1910s	1920s	1930s	1940s
1	OIL	OIL	OIL	CLUB	CLUB
2	CHURCH	GAS	CLUB	OIL	CHURCH
3	MINING	CHURCH	REALTY	REALTY	REALTY
4	LUMBER	CLUB	BUILDING	SERVICE	SERVICE
5	BANK	BANK	CHURCH	CHURCH	COUNTY
6	MANUFACTURING	MINING	LOAN	COUNTY	SUPPLY
7	CLUB	LUMBER	INVESTMENT	SUPPLY	CONSTRUCTION
8	LAND	REALTY	MOTOR	MOTOR	PRODUCTS
9	TELEPHONE	MANUFACTURING	SERVICE	PRODUCTS	OIL
10	GAS	COAL	LUMBER	INVESTMENT	MANUFACTURING

Rank	1950s	1960s	1970s	1980s	1990s
1	CLUB	SERVICE	SERVICE	CONSTRUCTION	MANAGEMENT
2	CHURCH	CLUB	CONSTRUCTION	SERVICE	CONSTRUCTION
3	REALTY	CONSTRUCTION	DEVELOPMENT	MANAGEMENT	SERVICE
4	SERVICE	CHURCH	REALTY	DEVELOPMENT	PROPERTIES
5	CONSTRUCTION	REALTY	CLUB	CENTER	DEVELOPMENT
6	DEVELOPMENT	DEVELOPMENT	CENTER	REALTY	CENTER
7	SUPPLY	SUPPLY	MANAGEMENT	PROPERTIES	FAMILY
8	COUNTY	CENTER	INDUSTRIES	AUTO	INVESTMENTS
9	INVESTMENT	COUNTY	CHURCH	CLUB	REALTY
10	OIL	PRODUCTS	AUTO	INVESTMENTS	AUTO

Most common bigrams in new firm names, by decade

Most common bigrams in new firm names, by decade

Rank	1900s	1910s	1920s	1930s	1940s
1	OIL_GAS	OIL_GAS	BUILDING_LOAN	OIL_GAS	BAPTIST_CHURCH
2	STATE_BANK	STATE_BANK	OIL_GAS	SOCIAL_CLUB	SOCIAL_CLUB
3	STREET_RAILWAY	BUILDING_LOAN	SOCIAL_CLUB	LEGION_DEPARTMENT	VETERANS_FOREIGN
4	MINING_MILLING	PRESBYTERIAN_CHURCH	BAPTIST_CHURCH	CHAMBER_COMMERCE	CHAMBER_COMMERCE
5	BUILDING_LOAN	BAPTIST_CHURCH	STATE_BANK	CREDIT_UNION	LUTHERAN_CHURCH
6	BAPTIST_CHURCH	LIGHT_POWER	REAL_ESTATE	BAPTIST_CHURCH	FOREIGN_UNITED
7	GOLD_MINING	SOCIAL_CLUB	PLEASURE_CLUB	INSURANCE_AGENCY	VOLUNTEER_FIRE
8	CHURCH_LATTER	LUTHERAN_CHURCH	LUTHERAN_CHURCH	FUNERAL_HOME	METHODIST_CHURCH
9	PRESBYTERIAN_CHURCH	METHODIST_CHURCH	CHAMBER_COMMERCE	POST_LEGION	FIRE_DEPARTMENT
10	REAL_ESTATE	TOWNSHIP_ELECTRIC	ATHLETIC_CLUB	ATHLETIC_CLUB	KIWANIS_CLUB

Rank	1950s	1960s	1970s	1980s	1990s
1	BAPTIST_CHURCH	BAPTIST_CHURCH	INSURANCE_AGENCY	REAL_ESTATE	REAL_ESTATE
2	INSURANCE_AGENCY	INSURANCE_AGENCY	REAL_ESTATE	INSURANCE_AGENCY	INSURANCE_AGENCY
3	METHODIST_CHURCH	REAL_ESTATE	BAPTIST_CHURCH	BAPTIST_CHURCH	HEALTH_CARE
4	CHAMBER_COMMERCE	METHODIST_CHURCH	AIR_CONDITIONING	OIL_GAS	BAPTIST_CHURCH
5	LUTHERAN_CHURCH	PLUMBING_HEATING	PLUMBING_HEATING	HEALTH_CARE	PROPERTY_MANAGEMENT
6	KIWANIS_CLUB	SOCIAL_CLUB	SOCIAL_CLUB	AIR_CONDITIONING	AIR_CONDITIONING
7	SOCIAL_CLUB	REALTY_TRUST	OIL_GAS	PLUMBING_HEATING	IMPORT_EXPORT
8	VOLUNTEER_FIRE	LUTHERAN_CHURCH	SERVICE_CENTER	CARE_CENTER	AUTO_REPAIR
9	UNITED_METHODIST	AIR_CONDITIONING	FUNERAL_HOME	AUTO_BODY	ASSET_MANAGEMENT
10	FIRE_DEPARTMENT	UNITED_METHODIST	CARE_CENTER	PROPERTY_MANAGEMENT	CAPITAL_MANAGEMENT

Most common **new** bigrams in new firm names, by decade

Most common new bigrams in new firm names (business registrations)

Rank	1950s	1960s	1970s	1980s
1	CAPITAL_MANAGEMENT	LAW_FIRM	LAWN_CARE	HOME_SOLUTIONS
2	INVESTMENT_PROPERTIES	BUSINESS_SOLUTIONS	LAW_OFFICE	PROPERTY_SOLUTIONS
3	LEARNING_CENTER	CONSTRUCTION_MANAGEMENT	HOME_INSPECTIONS	AFFORDABLE_HOUSING
4	HOME_IMPROVEMENTS	PROPERTY_INVESTMENTS	HOME_INSPECTION	MARKETING_SOLUTIONS
5	ESTATE_INVESTMENTS	PROFESSIONAL_LAW	SELF_STORAGE	TOWING_RECOVERY
6	LAWN_SERVICE	FAMILY_INVESTMENTS	ASSISTED_LIVING	ENERGY_SOLUTIONS
7	LIMOUSINE_SERVICE	MANAGEMENT_CONSULTING	MEDICAL_BILLING	ESTATE_SOLUTIONS
8	MEDICAL_EQUIPMENT	MEDICAL_MANAGEMENT	HAIR_SALON	CUTTING_EDGE
9	EQUIPMENT_LEASING	PROFESSIONAL_MEDICAL	MANAGEMENT_SOLUTIONS	NETWORK_SOLUTIONS
10	HOUSING_DEVELOPMENT	TECHNOLOGY_SOLUTIONS	SURGERY_CENTER	SPORTS_BAR

Most common new bigrams in new firm names (D&B 1990 sample)

Rank	1950s	1960s	1970s	1980s
1	HAIR_DESIGN	LAWN_CARE	HALLMARK_SHOP	HOUR_PHOTO
2	PRO_SHOP	GOLF_SHOP	HAIR_STUDIO	VIDEO_WORLD
3	JANITORIAL_SERVICE	HAIR_SALON	HOME_VIDEO	MAIL_BOXES
4	ONE_HOUR	LIMOUSINE_SERVICE	FITNESS_CENTER	FROZEN_YOGURT
5	JOINT_VENTURE	QUICK_STOP	CONVENIENCE_STORE	HOME_MEDICAL
6	TRUCK_REPAIR	SCREEN_PRINTING	SIR_SPEEDY	FAMILY_VIDEO
7	OFFICE_PRODUCTS	FRIED_CHICKEN	SPEEDY_PRINTING	VIDEO_PLUS
8	FAMILY_RESTAURANT	LEARNING_CENTER	VIDEO_PRODUCTIONS	PHOTO_EXPRESS
9	LAWN_SERVICE	COMPUTER_SERVICE	MEDICINE_SHOPPE	COMPUTER_SOLUTIONS
10	APPLIANCE_REPAIR	HAIR_DESIGNS	VIDEO_CENTER	CARE_MEDICAL

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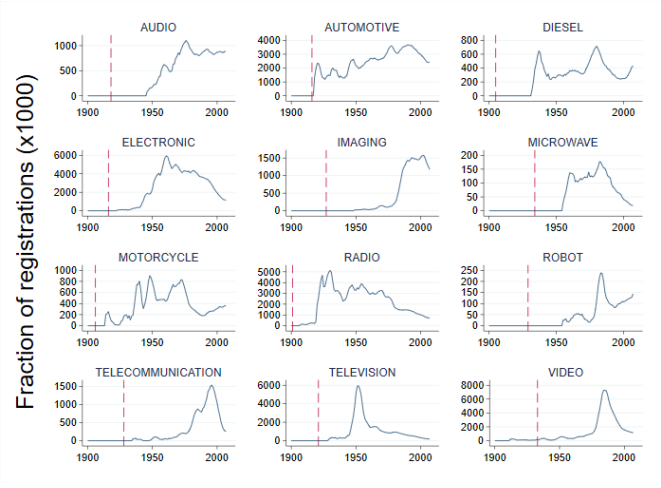
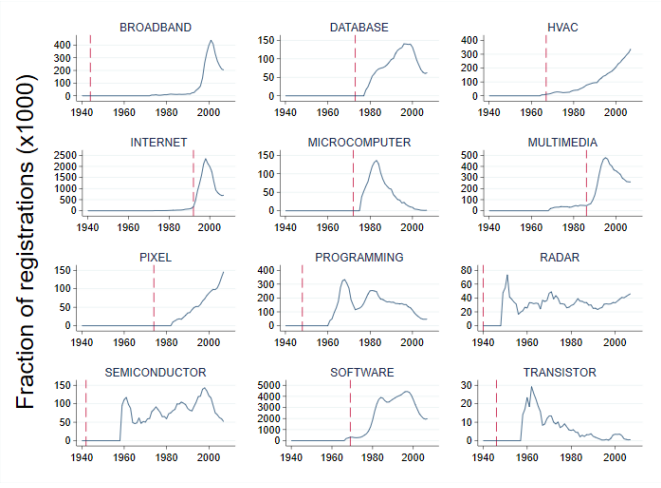
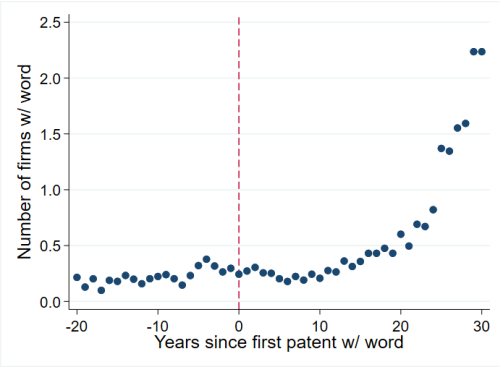
Diffusion of select technologies into new firm names: pre-1940

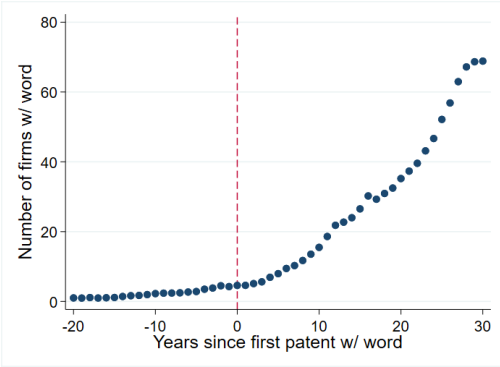


Diffusion of select technologies into new firm names: post-1940



Diffusion of technology into new firms: population averages

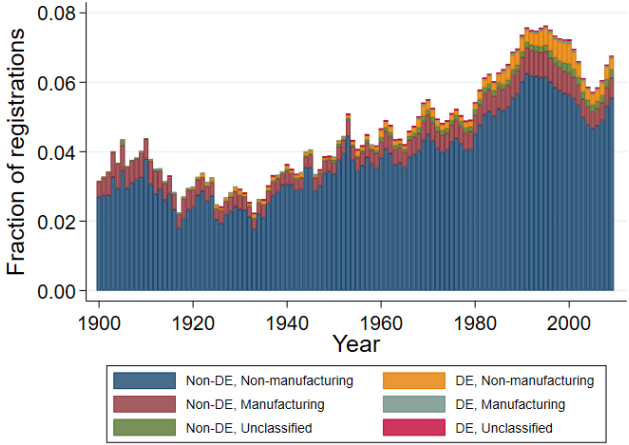




Fraction of states with a related startup after 5/10/20/30 years

	All firms			
	(1)	(2)	(3)	(4)
	5 years	10 years	20 years	30 years
1(Decade==1910s)	-0.003	0.001	-0.000	0.000
	(0.007)	(0.009)	(0.014)	(0.019)
1(Decade==1920s)	0.002	0.003	-0.003	0.001
	(0.009)	(0.010)	(0.014)	(0.019)
1(Decade==1930s)	-0.003	-0.004	0.001	0.022
	(0.007)	(0.009)	(0.015)	(0.022)
1(Decade==1940s)	0.006	0.015	0.037*	0.072***
	(0.009)	(0.013)	(0.019)	(0.026)
1(Decade==1950s)	0.035**	0.051**	0.097***	0.159***
	(0.017)	(0.020)	(0.026)	(0.033)
1(Decade==1960s)	0.036**	0.062***	0.119***	0.172***
	(0.017)	(0.021)	(0.028)	(0.034)
1(Decade==1970s)	0.108***	0.154***	0.232***	0.300***
	(0.027)	(0.032)	(0.039)	(0.044)
1(Decade==1980s)	0.116***	0.159***	0.241***	0.000
	(0.025)	(0.028)	(0.034)	(.)
1(Decade==1990s)	0.172***	0.228***	0.000	0.000
	(0.024)	(0.027)	(.)	(.)
N	1092	1092	929	820
R^2	0.12	0.15	0.15	0.14
Y mean				

Composition of technology-related entrepreneurship: Non-manufacturing local firms comprise lion's share



Roadmap

1. What do we know about long-run U.S. entrepreneurship?
2. How we measure historical firm creation
3. Entrepreneurship since 1900: New facts
4. Entrepreneurship and innovation
5. Insights for endogenous growth and beyond

Why does this matter?

- The endogenous growth literature has primarily focused on *innovating entrepreneurs* as the engine of creative destruction in the modern economy.
- With this paper, we have begun to consider that Hurst & Pugsley entrepreneurs—small, local, not seeking to grow—are the agents of change.
- We think this is a useful idea to bring into focus, and one way to do so is to show how it can be defined and embedded in traditional models of growth.

Entrepreneurship and endogenous growth

We treat the entrepreneur's role in the economy as coming up with business models that enhance an innovation or facilitate its diffusion

These entrepreneurs often have comparative advantage over technology creators in the activities where they add to the value chain

In practice, there are different breeds. For example:

- The retailer: identifying local consumer demand for technology
- The mechanic: local installation and repairs
- The rental enterprise: making indivisible capital divisible

How Main Street entrepreneurs drive endogenous growth

Simplest structure as follows:

1. Labor force is divided into productive and entrepreneurial sectors
   - Empirically, we might measure these as as wage workers vs. the self-employed
   - Suppose entrepreneurial share is ϵ and the productive share is $1 - \epsilon$

How Main Street entrepreneurs drive endogenous growth

Simplest structure as follows:

1. Labor force is divided into productive and entrepreneurial sectors
2. Innovation has to be taken up by entrepreneurs to increase productivity
3. Innovation arrives according to a Poisson process with rate parameter μ, and new businesses form around each innovation according to Poisson process with rate ν
4. $\mu(\cdot)$ and $\nu(\cdot)$ are functions of inputs (R&D investment, entrepreneurial labor)

How Main Street entrepreneurs drive endogenous growth

Baseline result: growth rate max'ed by balancing productive and entrepreneurial labor

- When $\epsilon = 0$, $g = 0$, because no innovations make it to Main Street
- When $\epsilon = 1$, $g = 0$ because nobody produces for Main Street
- An $\epsilon = 0.5$ balances entrepreneurship and scale effects

*Note: If we added a representative consumer, the utility-maximizing allocation of labor to entrepreneurship would be lower, because we will value consumption out of current output

Examples of opportunities to extend

- ϵ is in practice endogenous to policy choices which influence the size of the entrepreneurial sector via incentives for local entrepreneurship
- There might be decreasing returns to entrepreneurship, if the marginal productivity of entrepreneurs declines as the sector grows
  - The rate at which entrepreneurial productivity decreases with the sector's size would determine how big the entrepreneurial sector should be
  - We can model and estimate this with, e.g., self-employment income
- We could add innovative labor to productive and entrepreneurial
  - Growth still maximized when labor evenly allocated across sectors

Discussion + Conclusion

Recap of what we have seen

1. WW2 was a turning point in the development of the American entrepreneurial economy: whereas new firm growth was anemic before, it's been vigorous since
2. Entrepreneurship illustrates, and perhaps drove, the structural transformation of the U.S. from an extractive, to industrial, to post-industrial economy
3. Entrepreneurship has become increasingly connected to technological change
4. Main Street entrepreneurs appear to play a fundamental role in economic growth
   - "It is his job to locate new ideas and put them into effect." (Baumol 1968)
   - "[This] function does not essentially consist in either inventing anything or otherwise creating the conditions which the enterprise exploits. It consists in getting things done." (Schumpeter 1942)

We think this paper raises many valuable questions, and we hope might add renewed vigor to research on...

- Historical entrepreneurship
- Entrepreneurship and structural transformation
- Entrepreneurship in economic growth

... as well as bring new perspectives to research on the relationship between entrepreneurship and innovation

A new perspective on the productivity paradox?

Consider the following puzzle:

- High-growth entrepreneurship is at an all time high, as is venture capital.
- Economic growth has also been falling over time.

Under the traditional view of endogenous growth, (1) and (2) are in conflict.

But, if local firms matter more for innovation-driven growth than we have realized, then slowing growth could be a result of declining dynamism in local entrepreneurship, because we're not producing these key complements at the rate needed to transform innovation into growth.

Despite sustained growth in new firm creation since WW2, warning signs of stagnating business innovation since 1980