
Entry and Entrants in Innovative New Industries

**Steven Klepper
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**What Do We Know about
Entry and Entrants in
Innovative New Industries?**

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Carnegie Mellon University**

Evolution of New U.S. Industries

- **What determines an industry's market structure?**
 - 4 extreme cases of shakeouts & evolution of oligopoly
 - Autos, tires, penicillin, television
 - Exception that proves the rule--lasers
- **How do dynamic industry regional clusters emerge?**
 - 3 celebrated agglomerations
 - Semiconductors & Silicon Valley
 - Autos & Detroit (Michigan)
 - Tires & Akron (Ohio)
- **Where do great companies come from?**
 - Autos—Ford, General Motors, Chrysler
 - Tires—Goodyear, Firestone
 - Semiconductors—Intel, Texas Instruments
- **What drives a nation's growth?**
 - Growth industries: autos, tires, antibiotics, televisions, semiconductors
 - Modern decline—autos, tires, televisions

Implications

- **Management practice**
 - **Competition policy**
 - **Economic Theorizing**
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Nano-economics

- **Identify every entrant**
 - Year of entry, exit
 - Base location (branches)
 - Ownership, acquisitions
 - Initial capitalization, products (some cases)
 - Market shares (of leaders)

- **Origin of entrants**
 - Intellectual origin
 - Diversifiers & prior products
 - Spinoffs—primary & secondary parents
 - Other startups
 - Geographic origin—prior work/residence

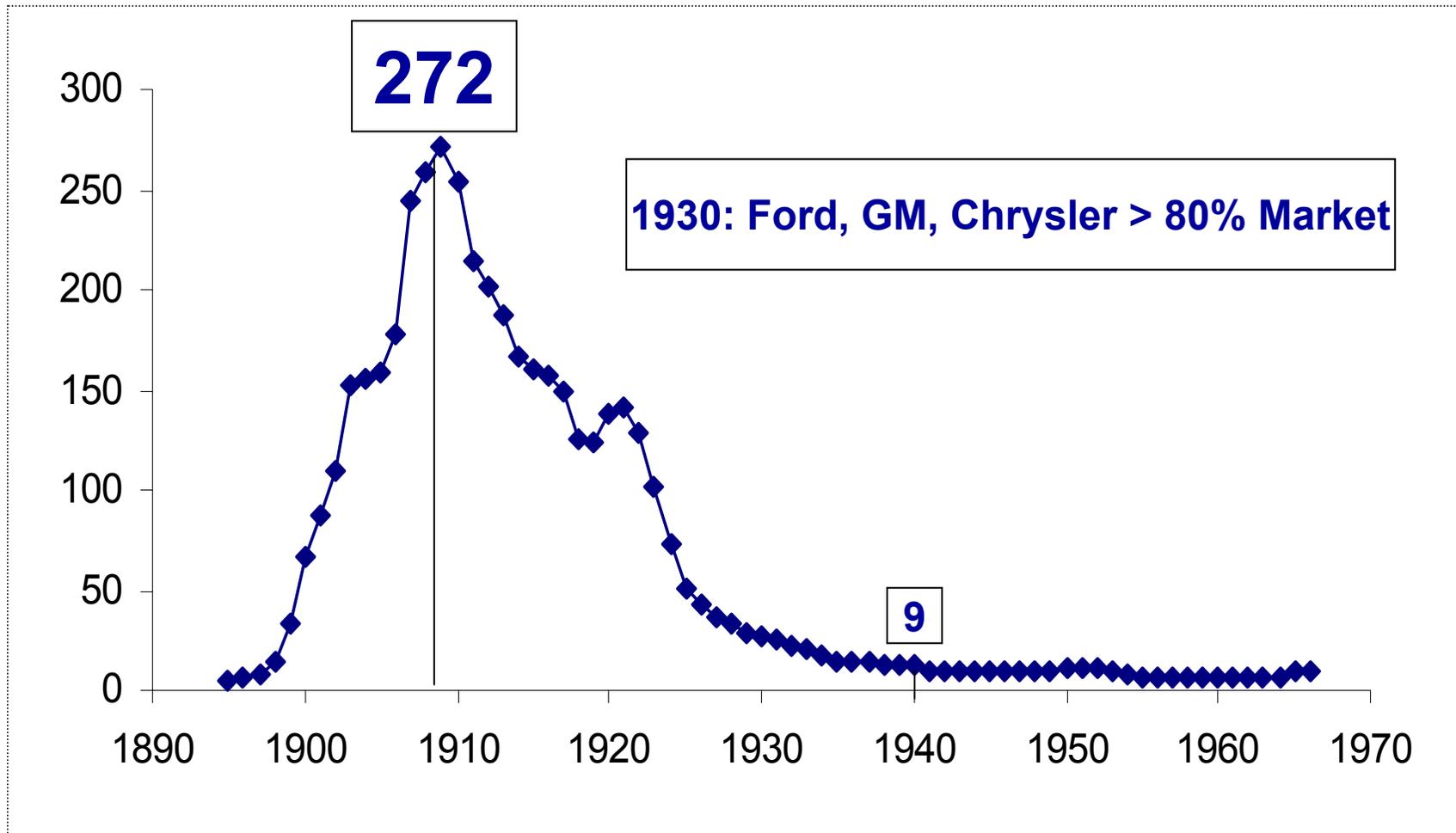
- **Entry decision**
 - Identify potential diversifiers & characteristics
 - Impetus for spinoffs & founders

- **Innovators & nature of innovations**
 - Industry and firm innovation & patent history

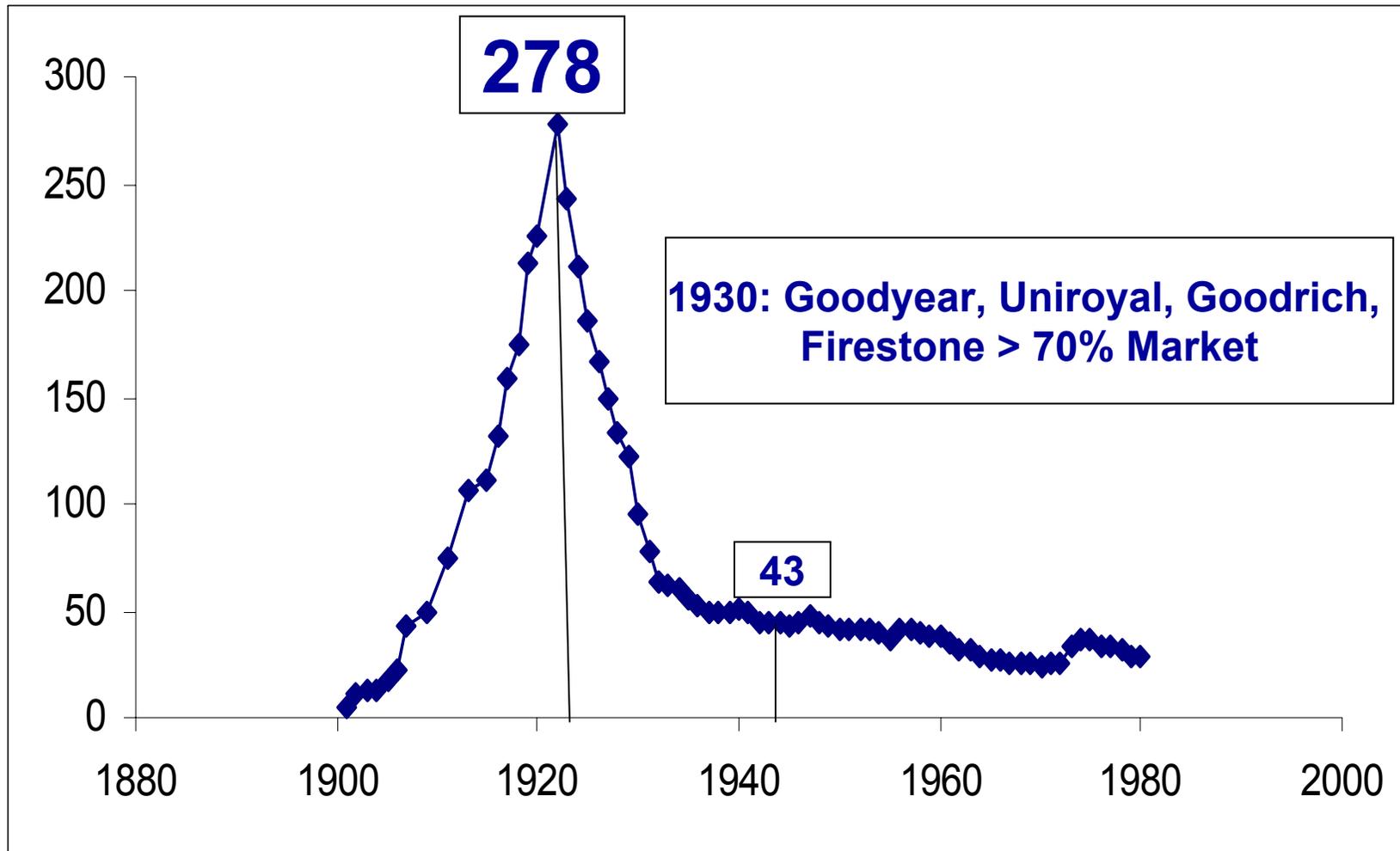
Shakeouts: U.S. Auto Industry

1930: Ford, GM, Chrysler > 80% Market

Shakeouts: U.S. Auto Industry



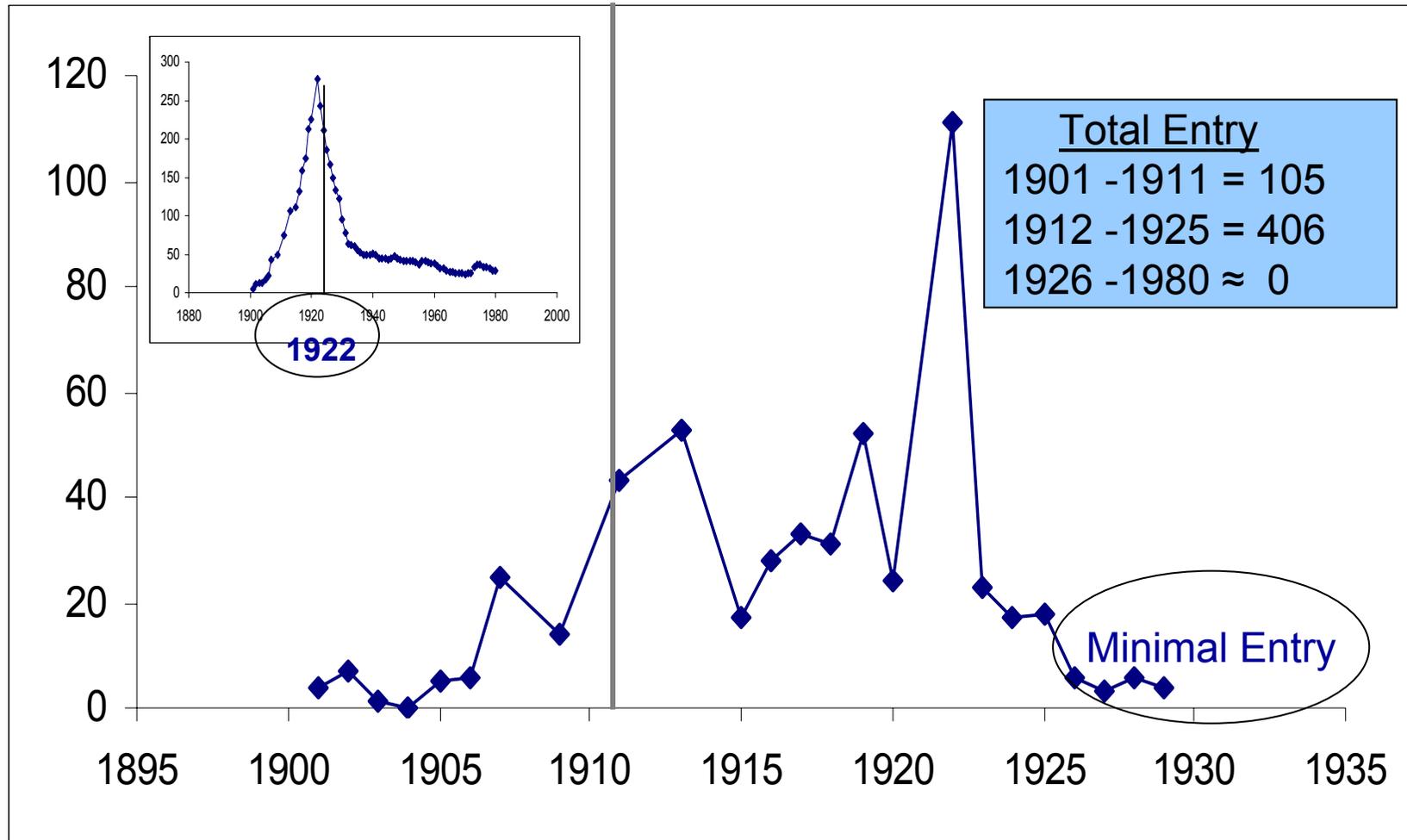
Shakeouts: U.S. Tire Industry



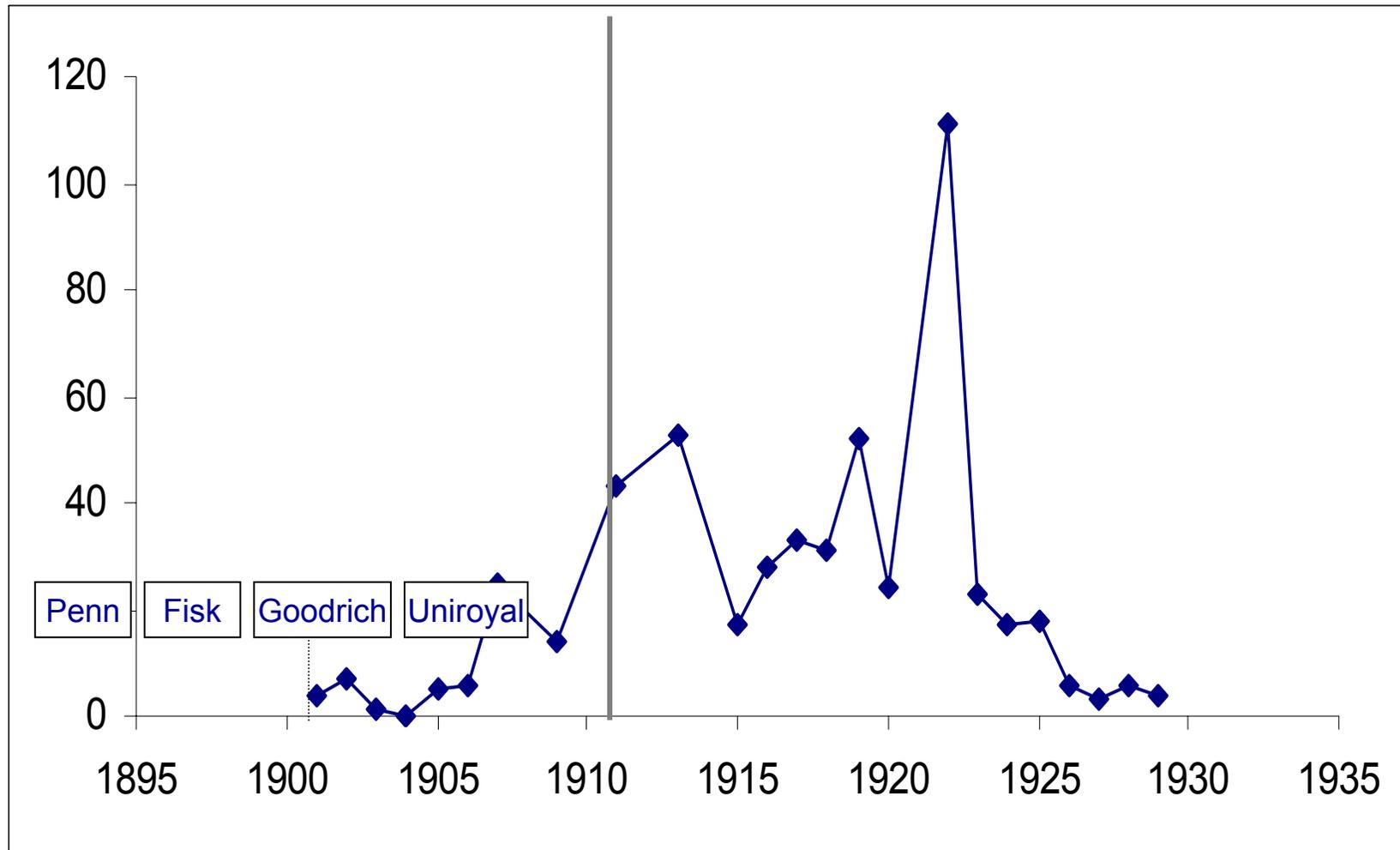
Entry

- How does entry evolve?
 - Opportunities change over time
- Which entrants succeed—role of entry timing
 - Ascending to ranks of leaders

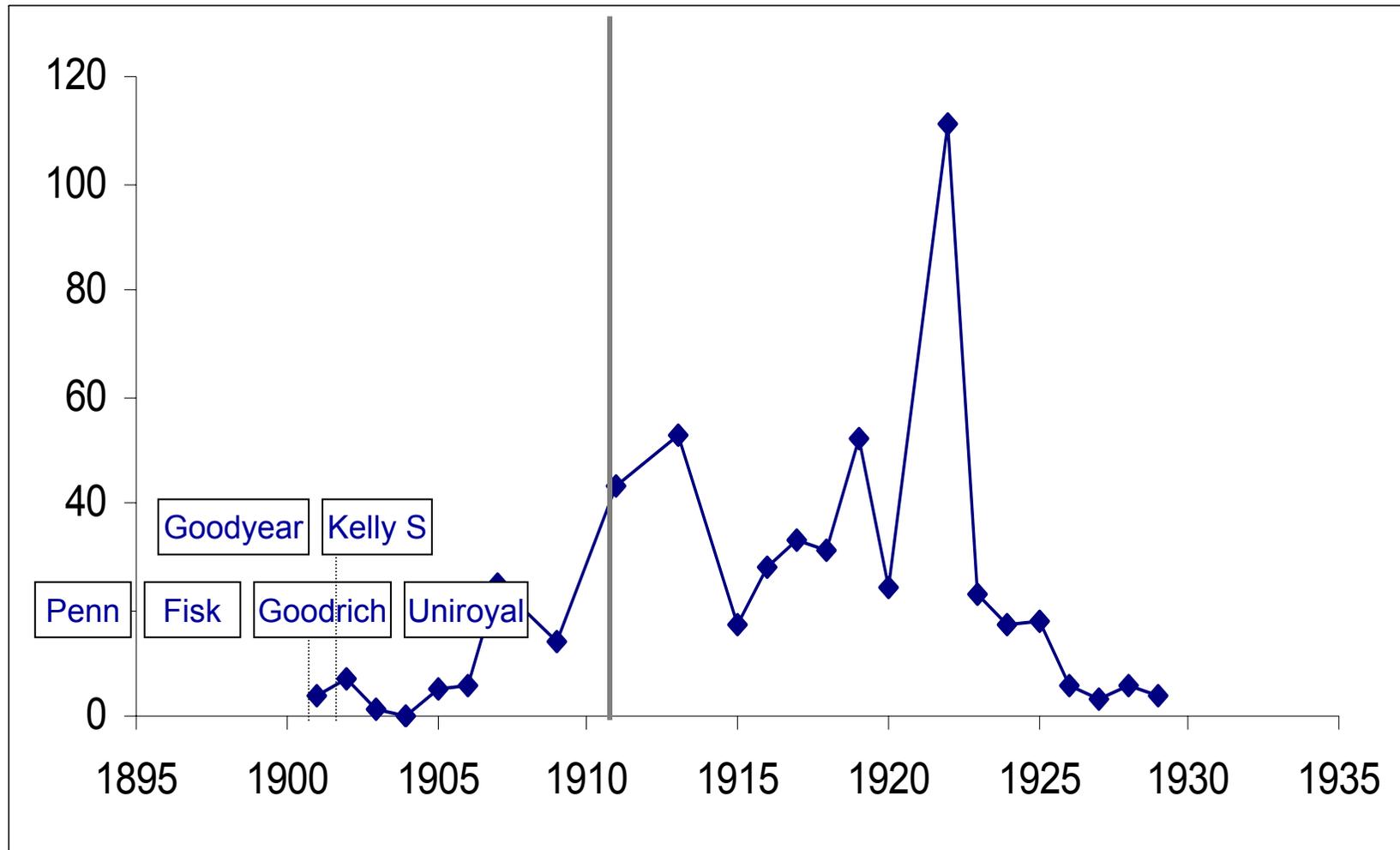
U.S. Tire Entry



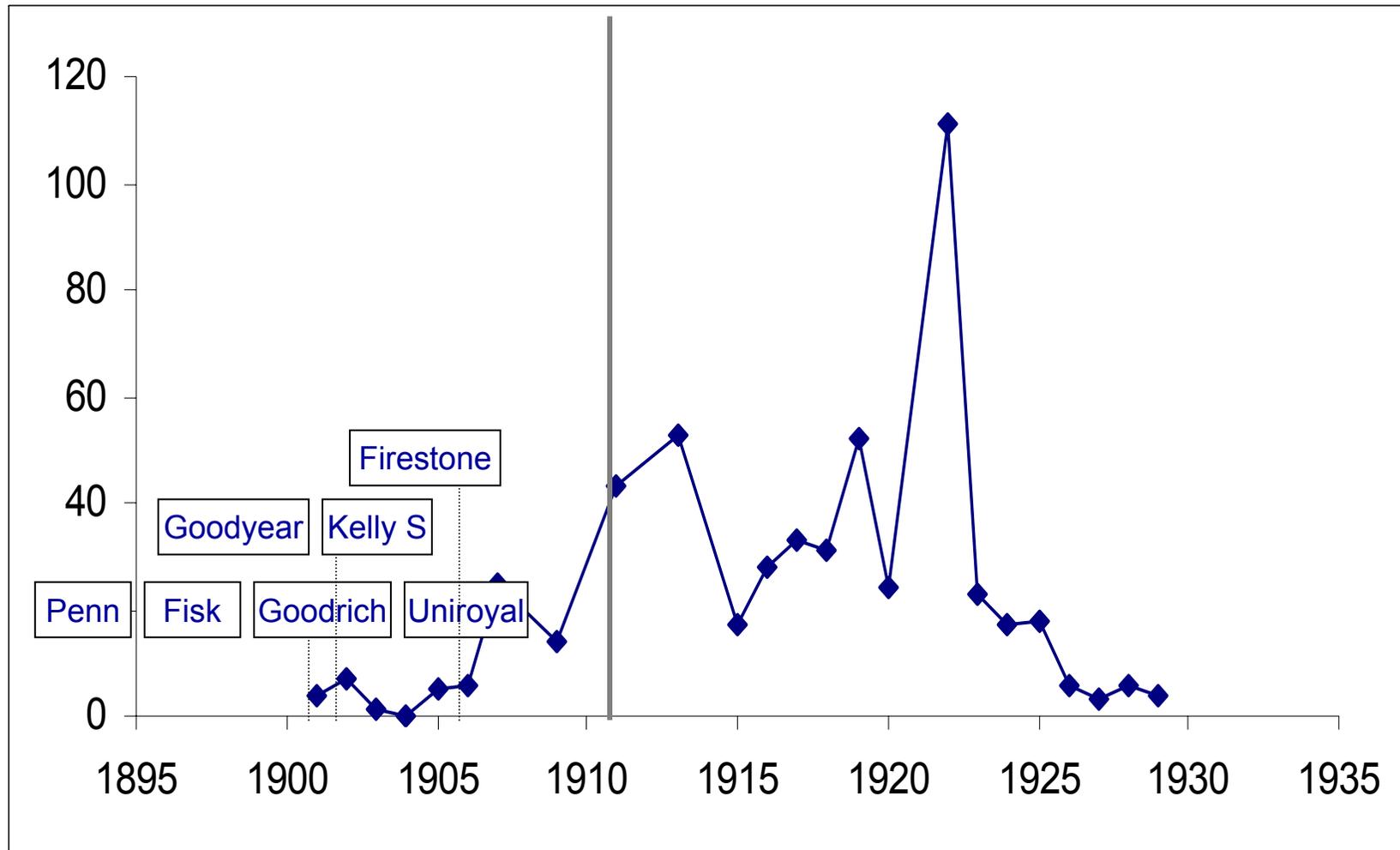
Entry of the Leaders



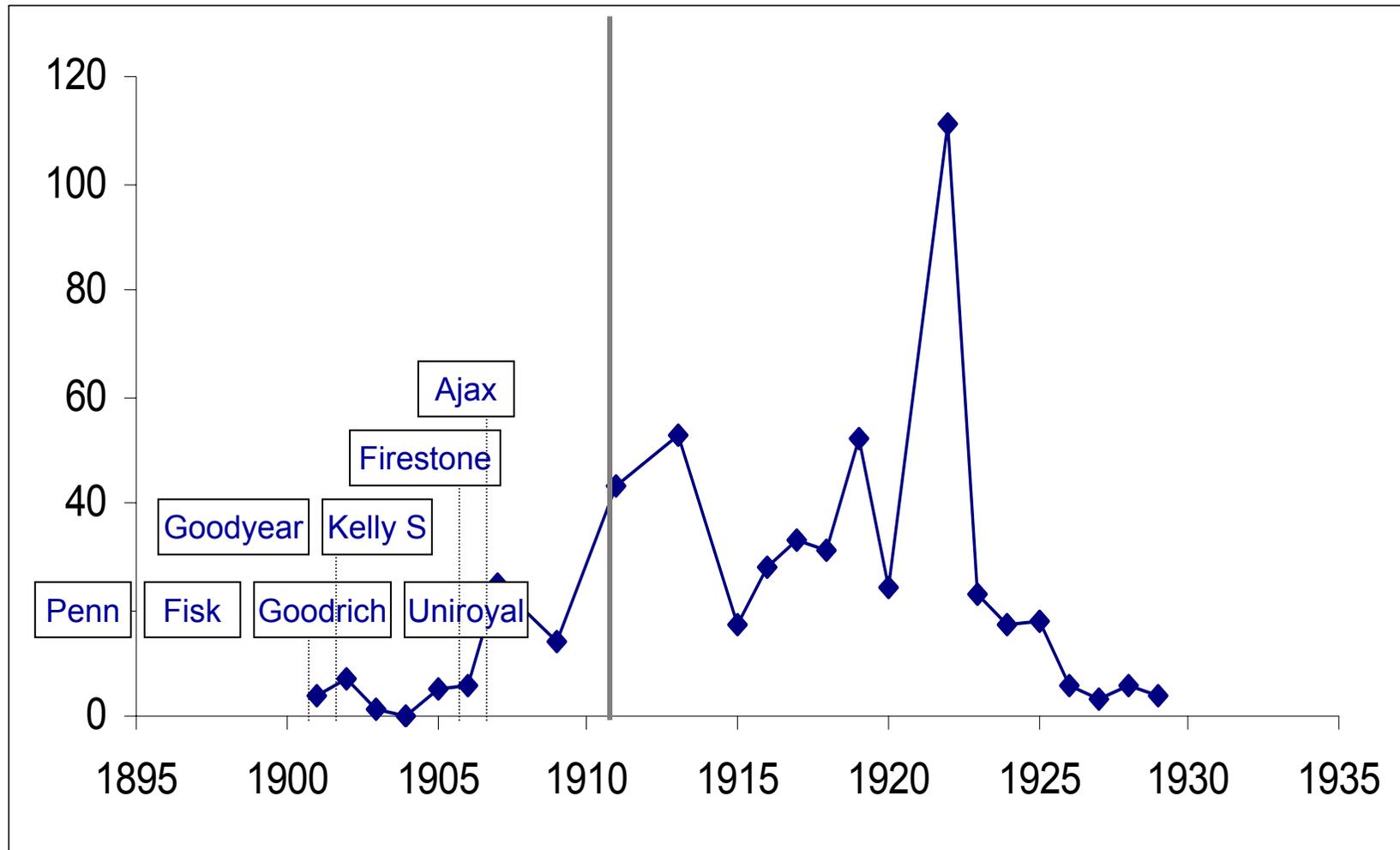
Entry of the Leaders



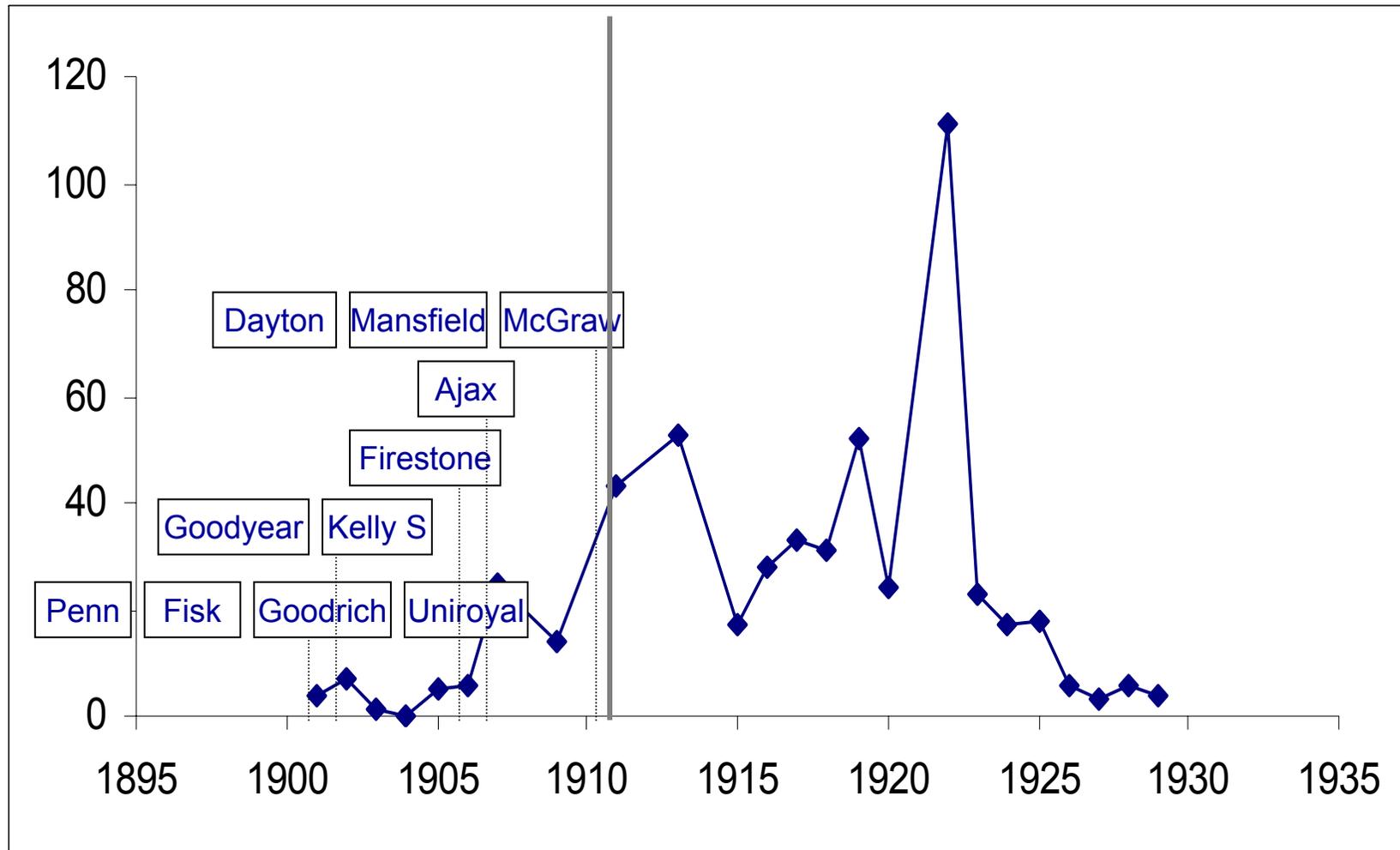
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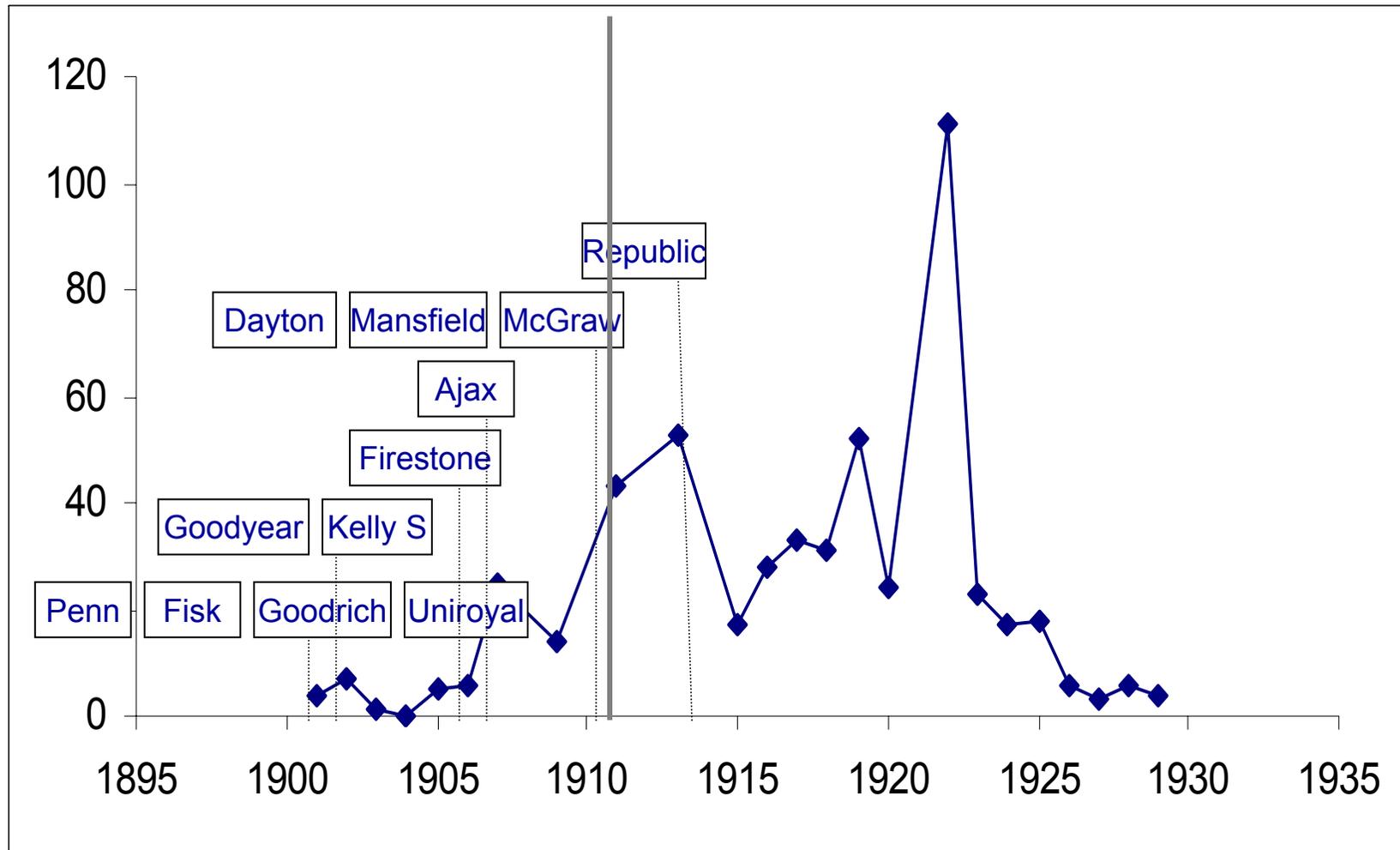
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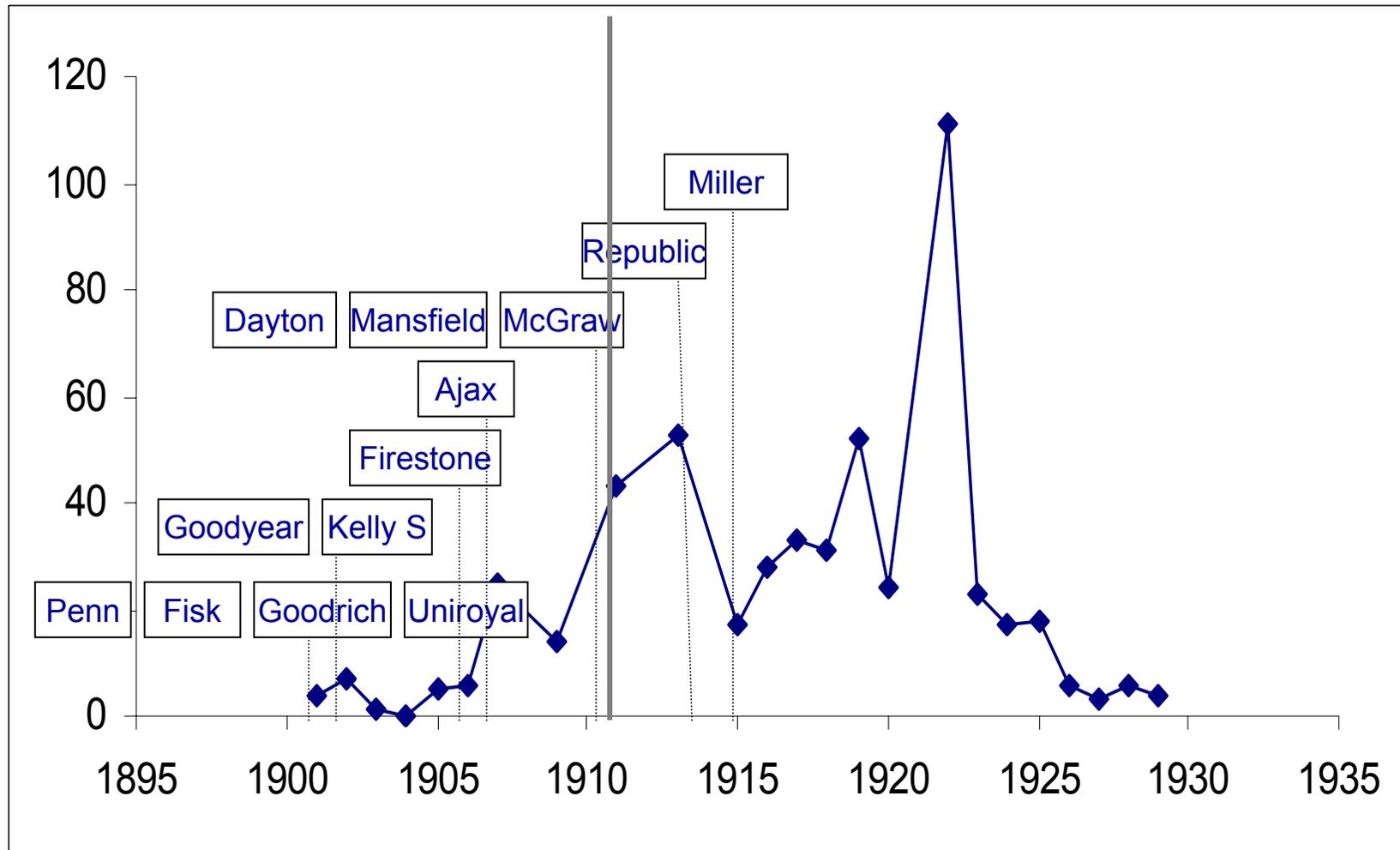
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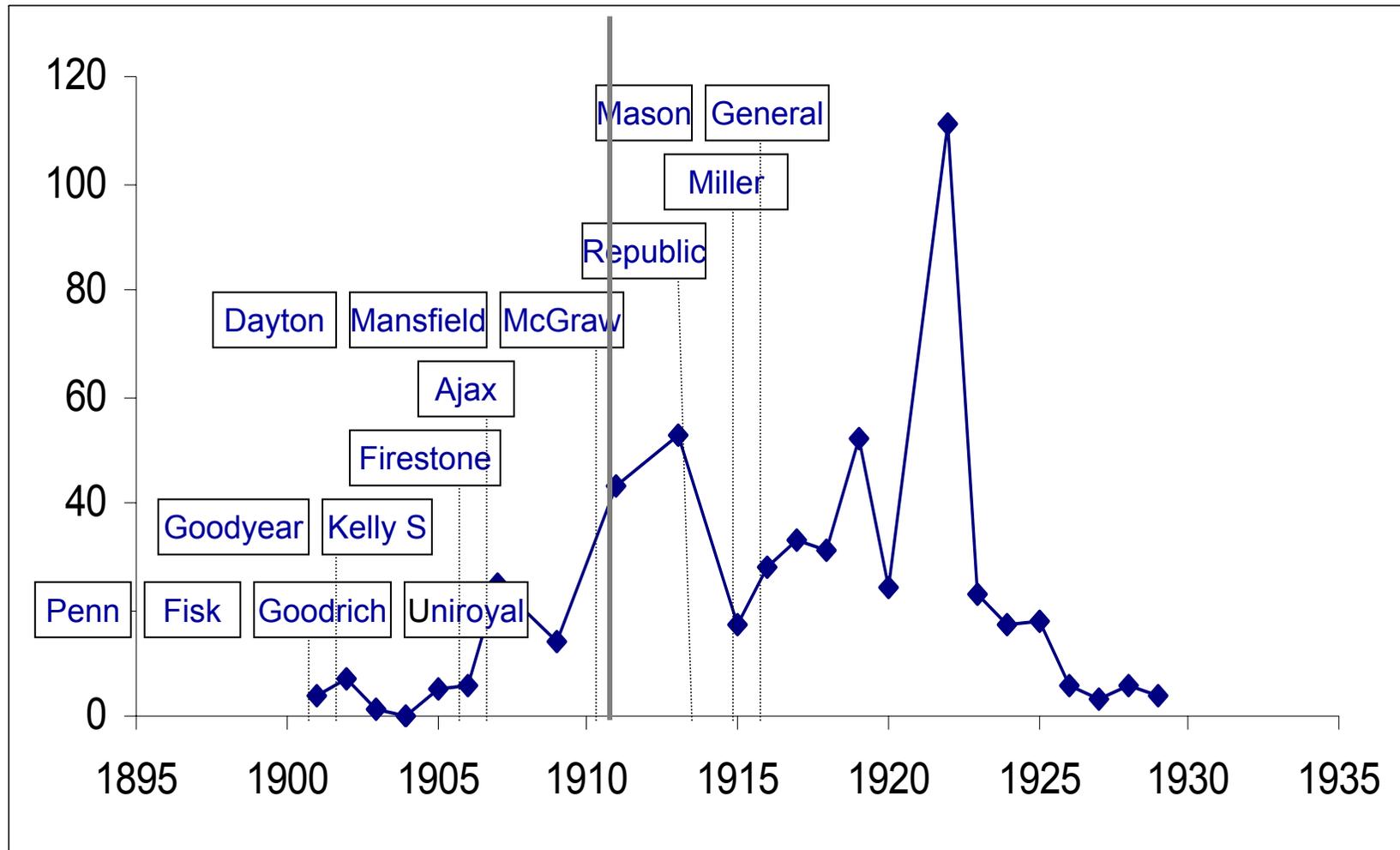
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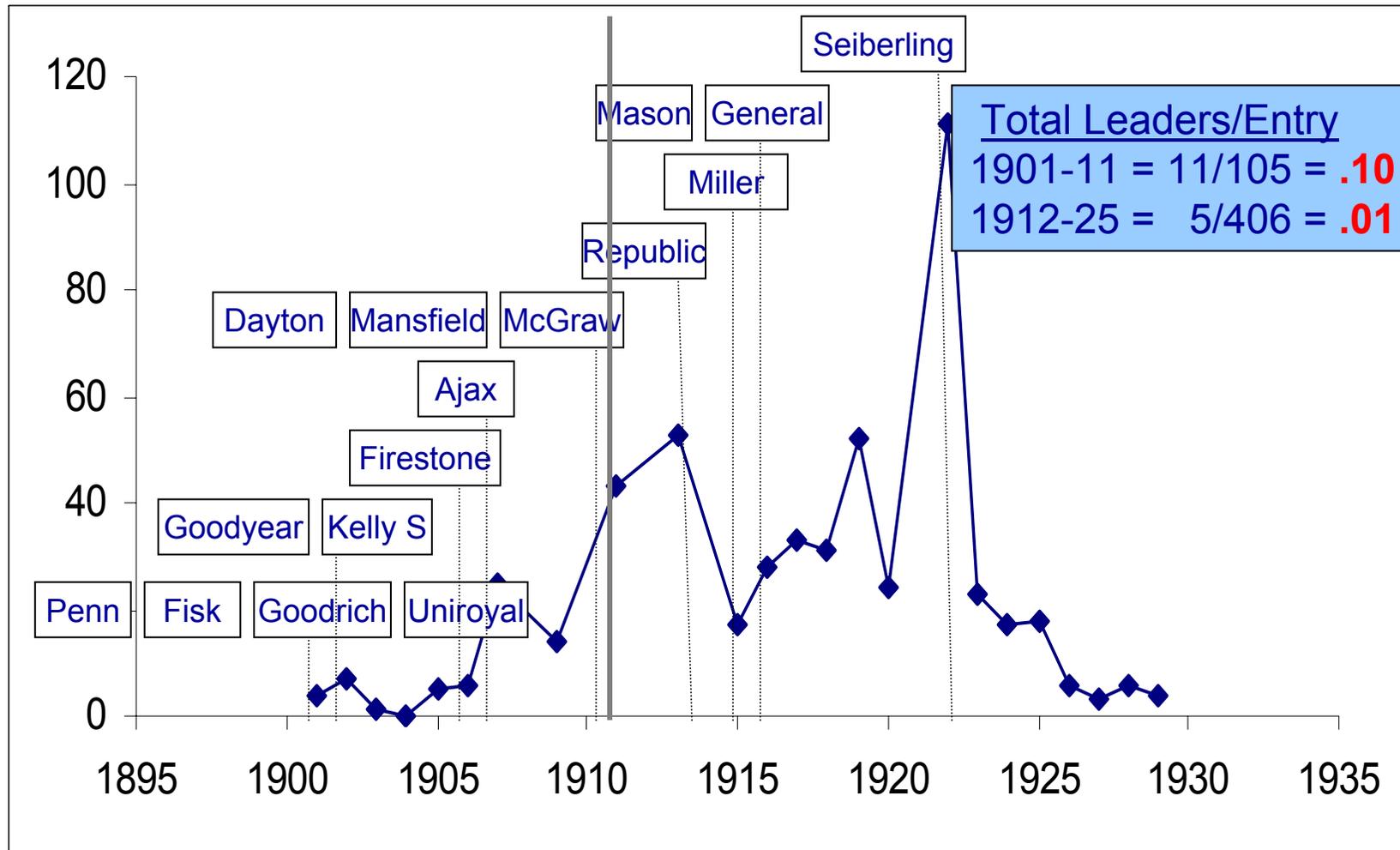
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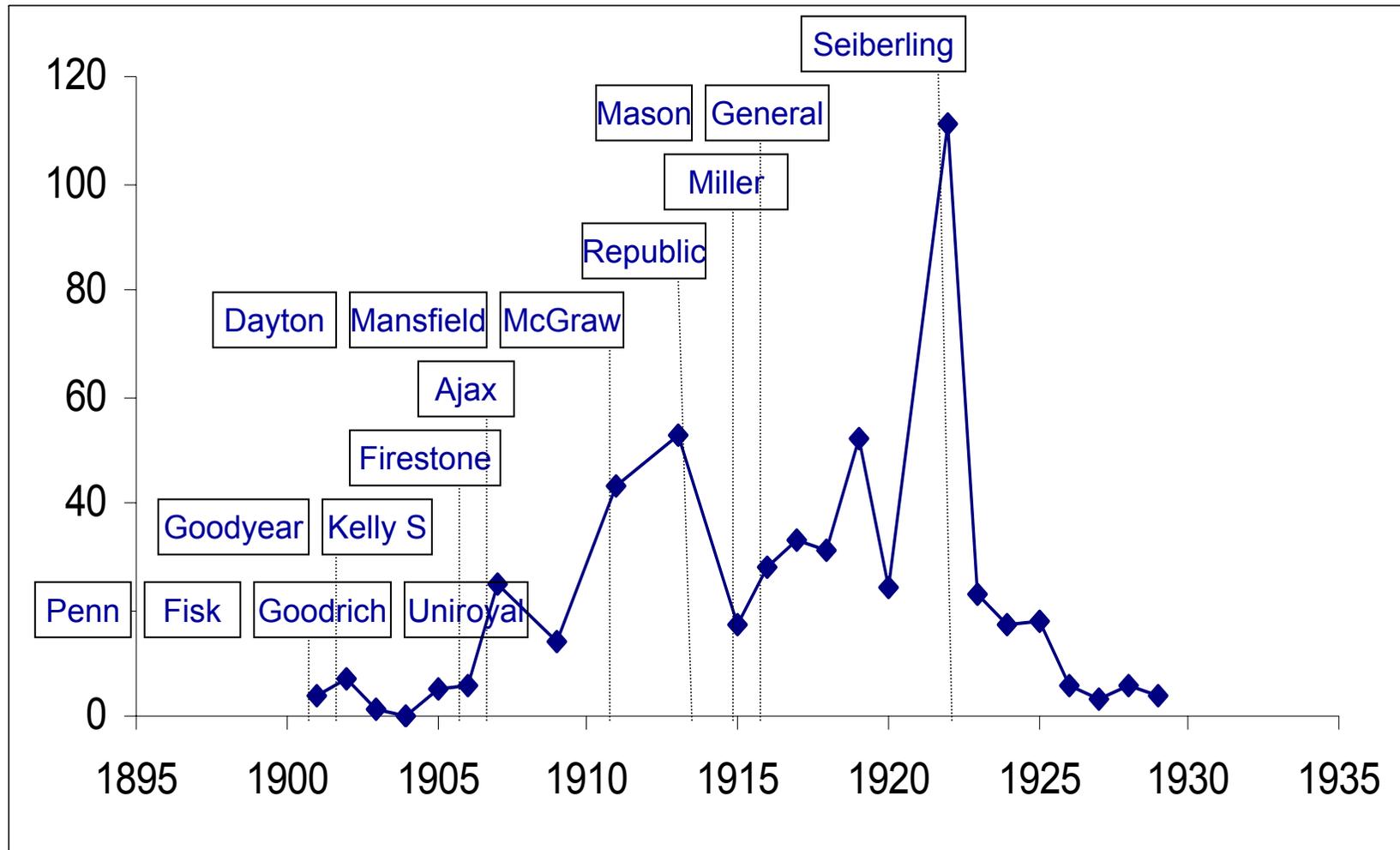


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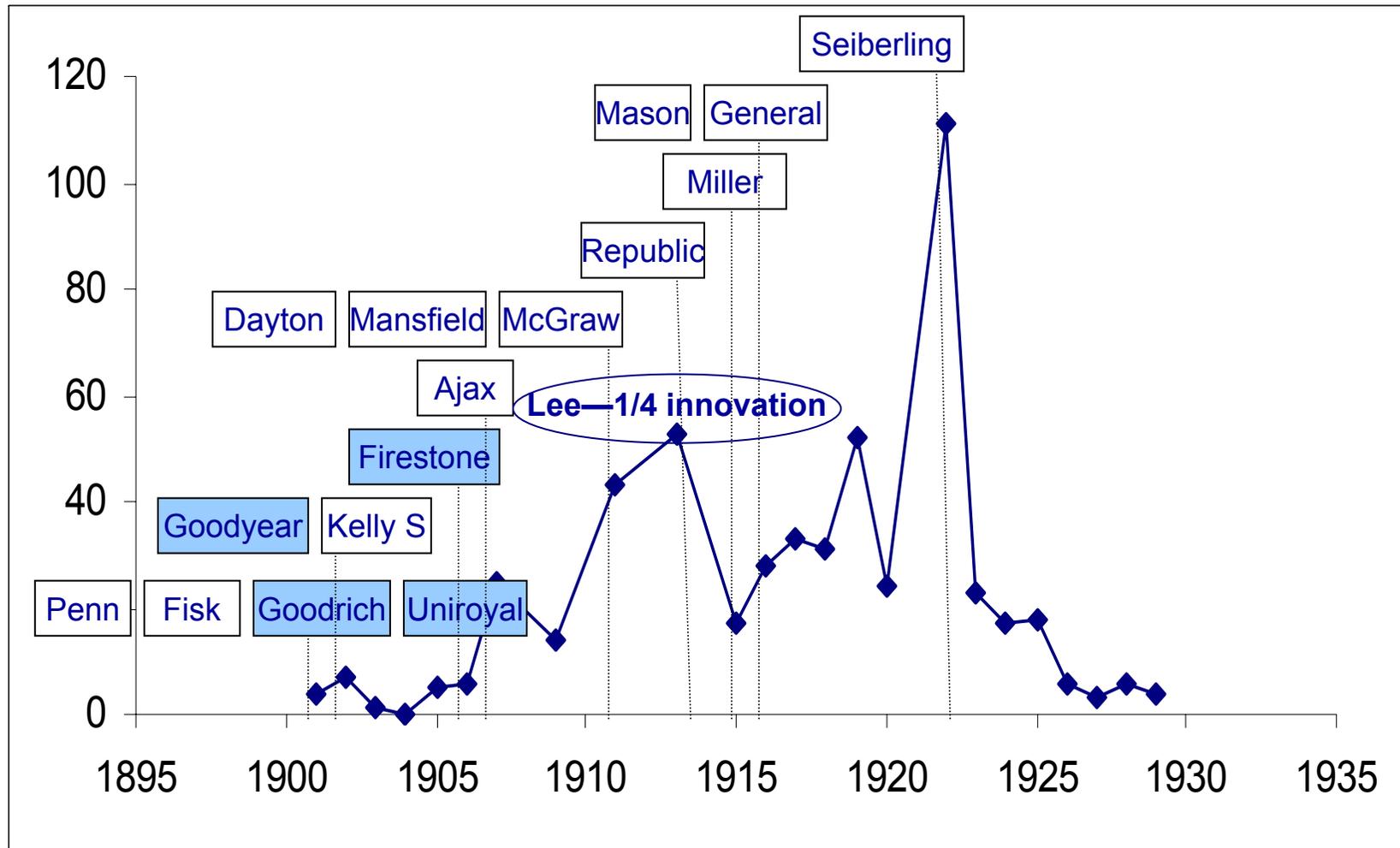


16 Major Innovations of Tire Producers—1895-1940

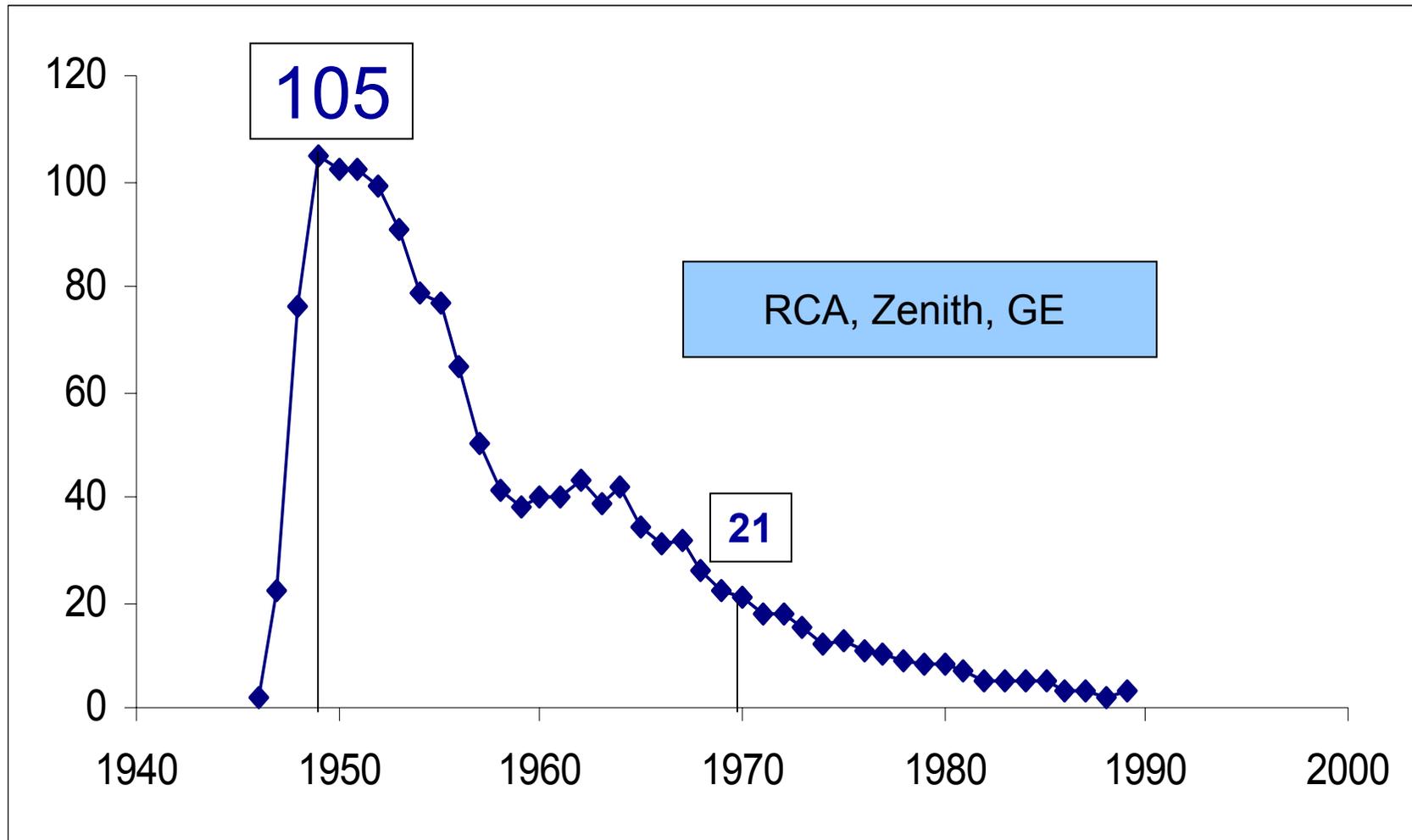
Who Innovates?



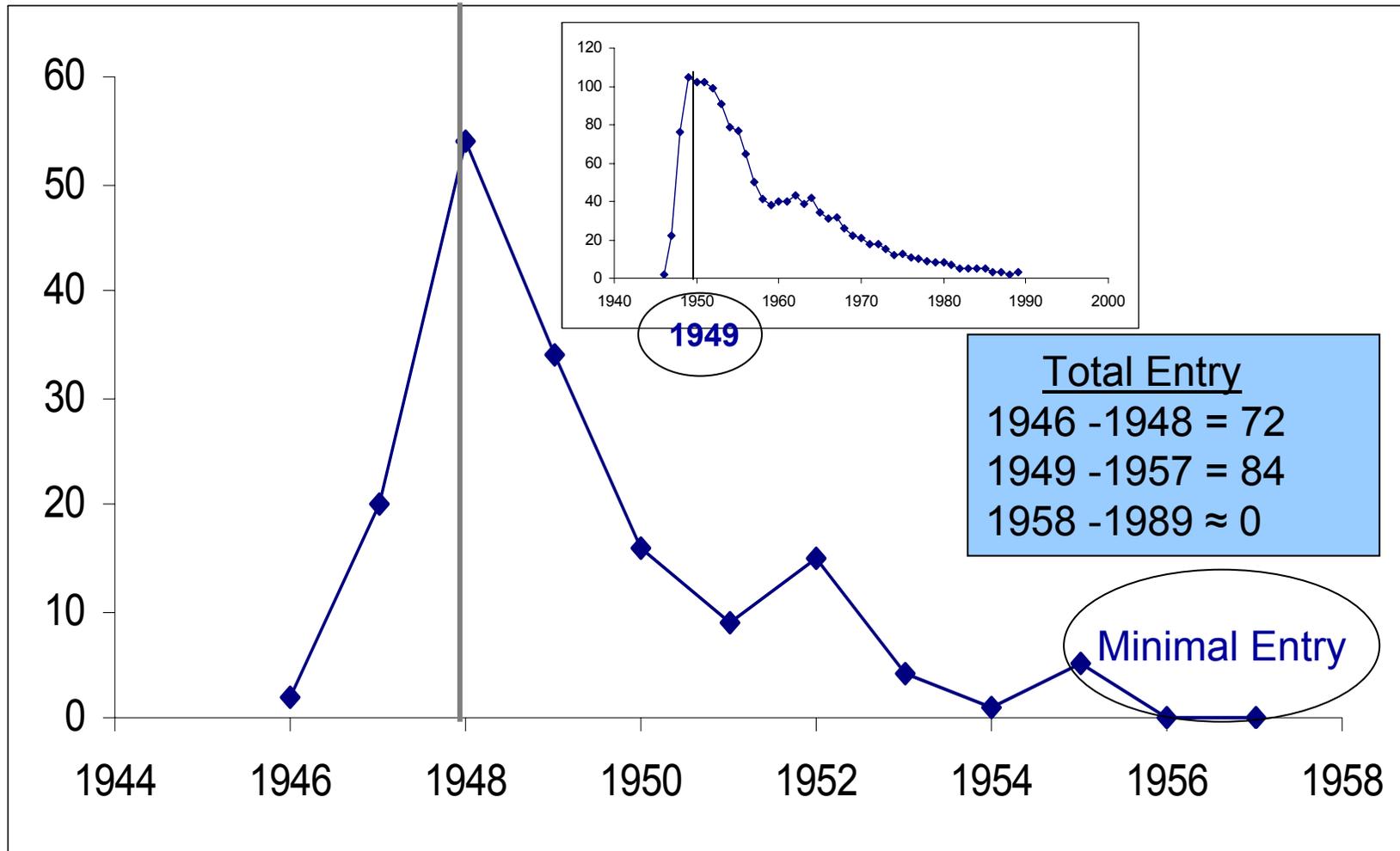
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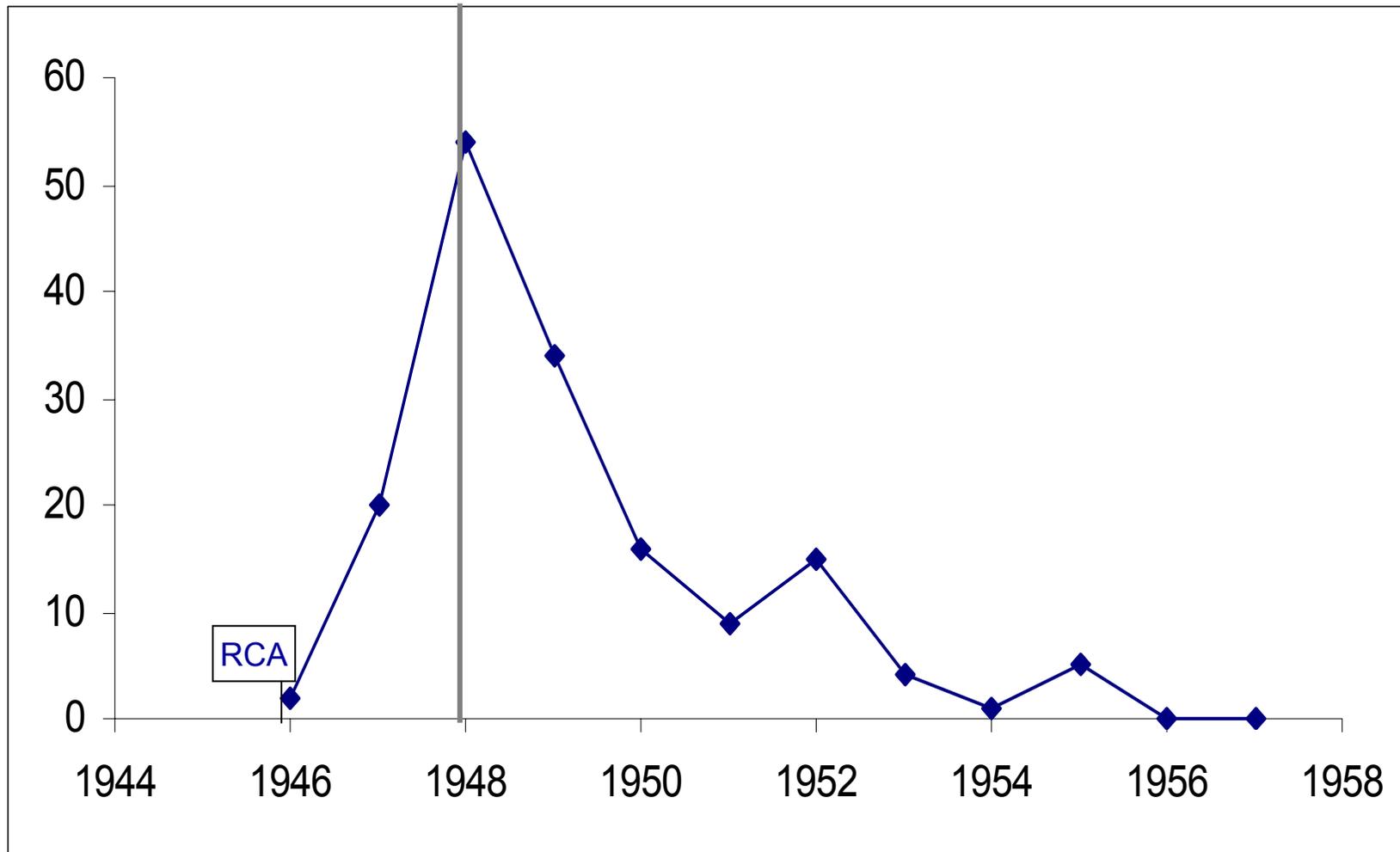
Shakeouts: U.S. TV Industry



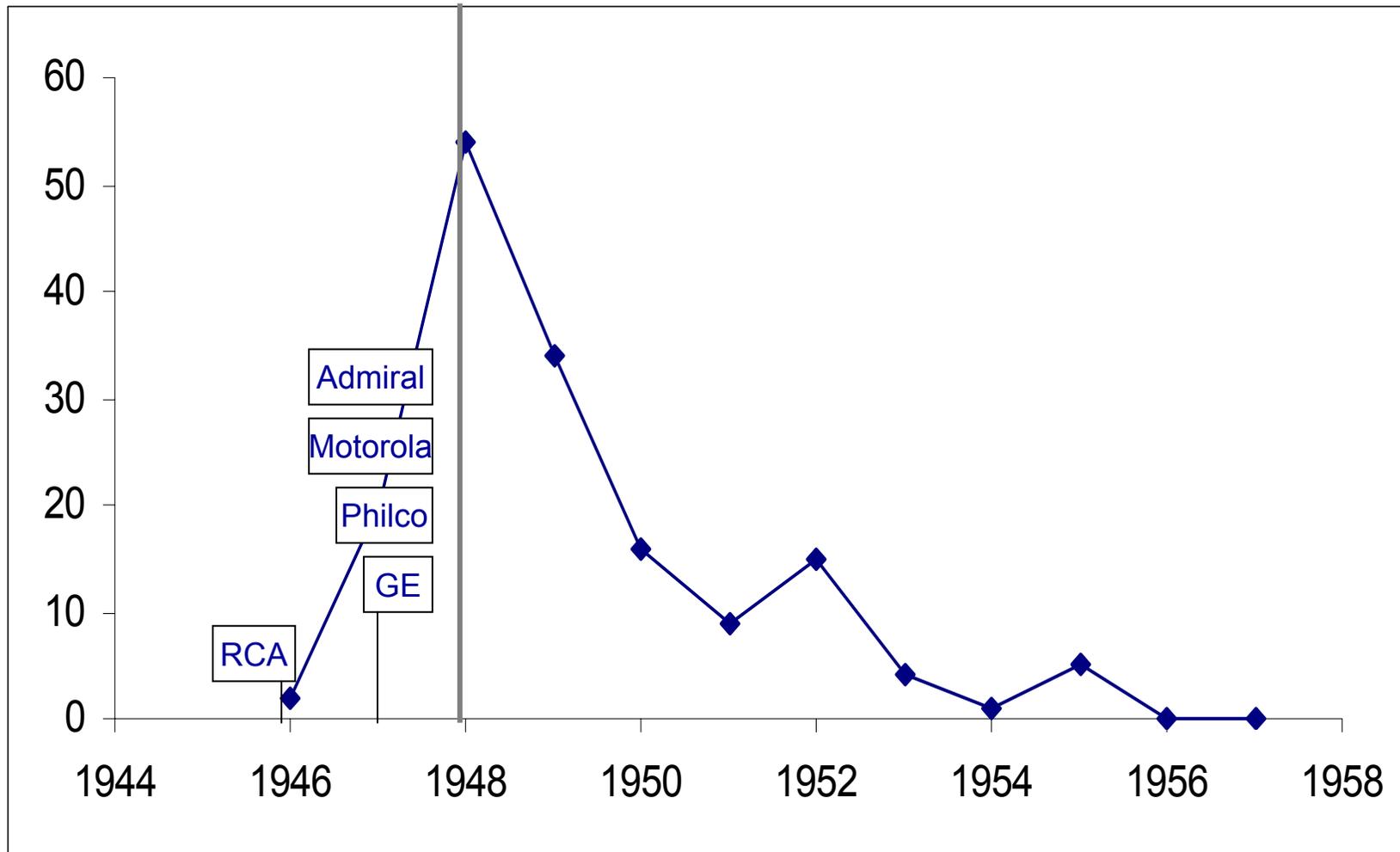
U.S. Television Entry



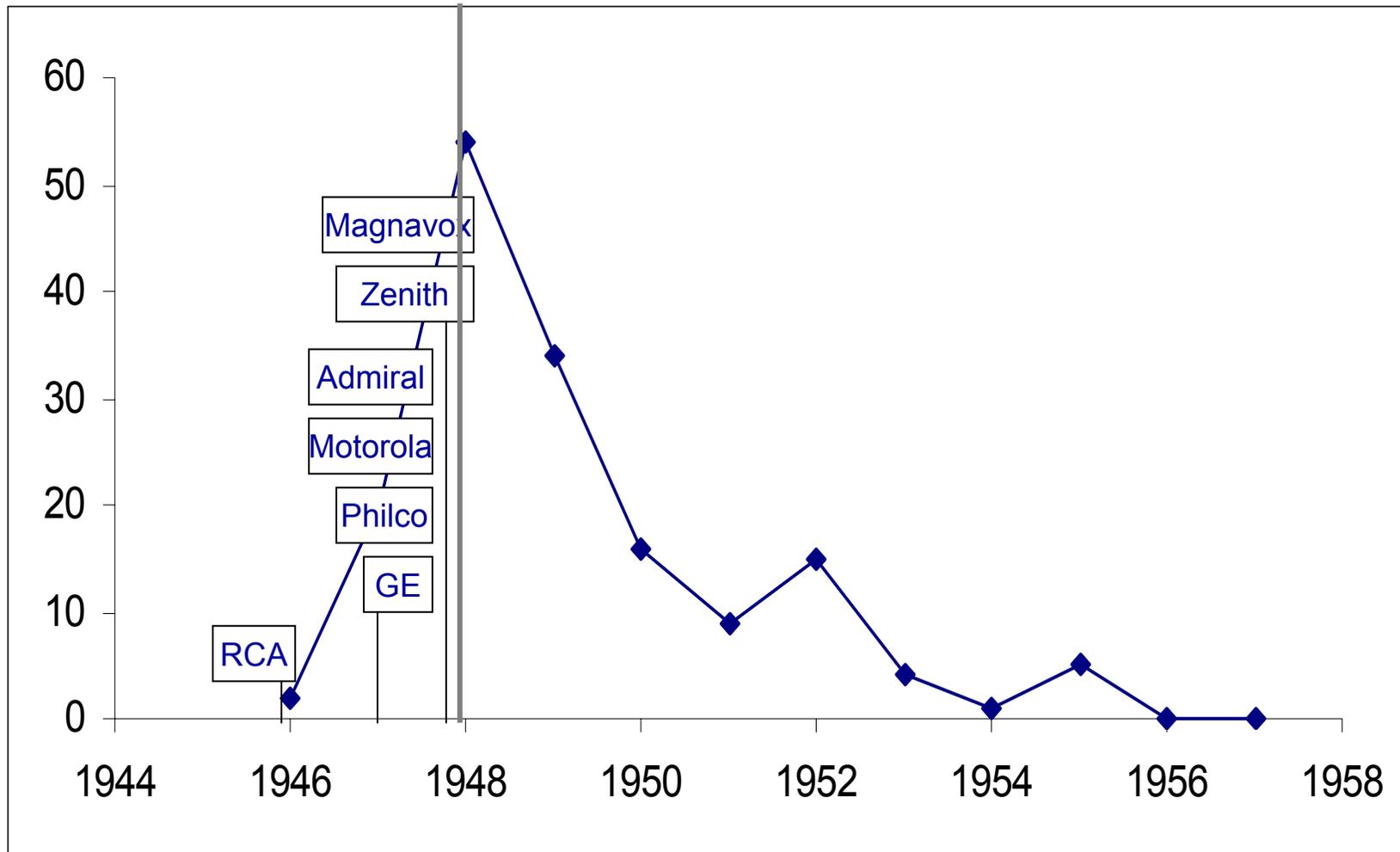
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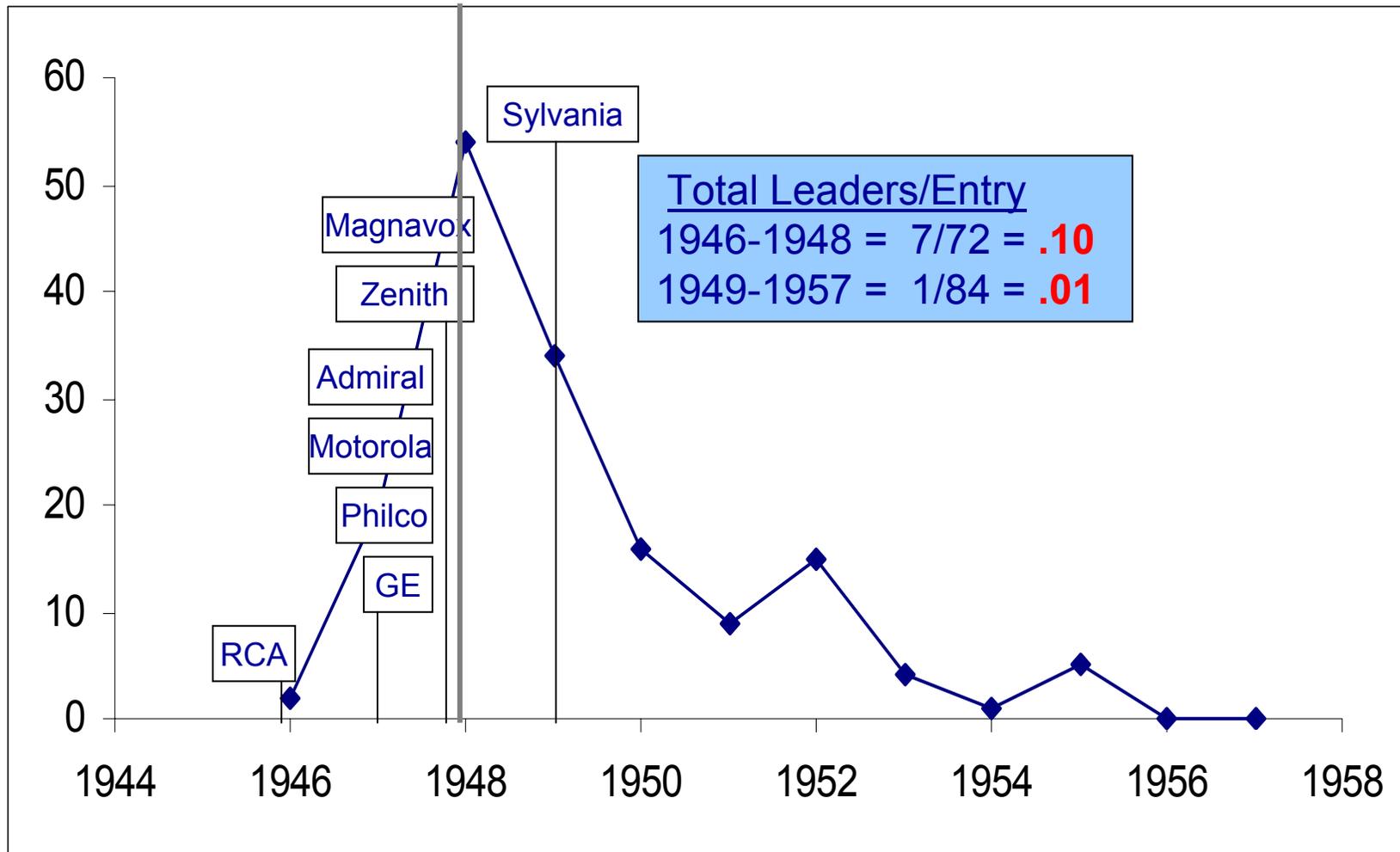
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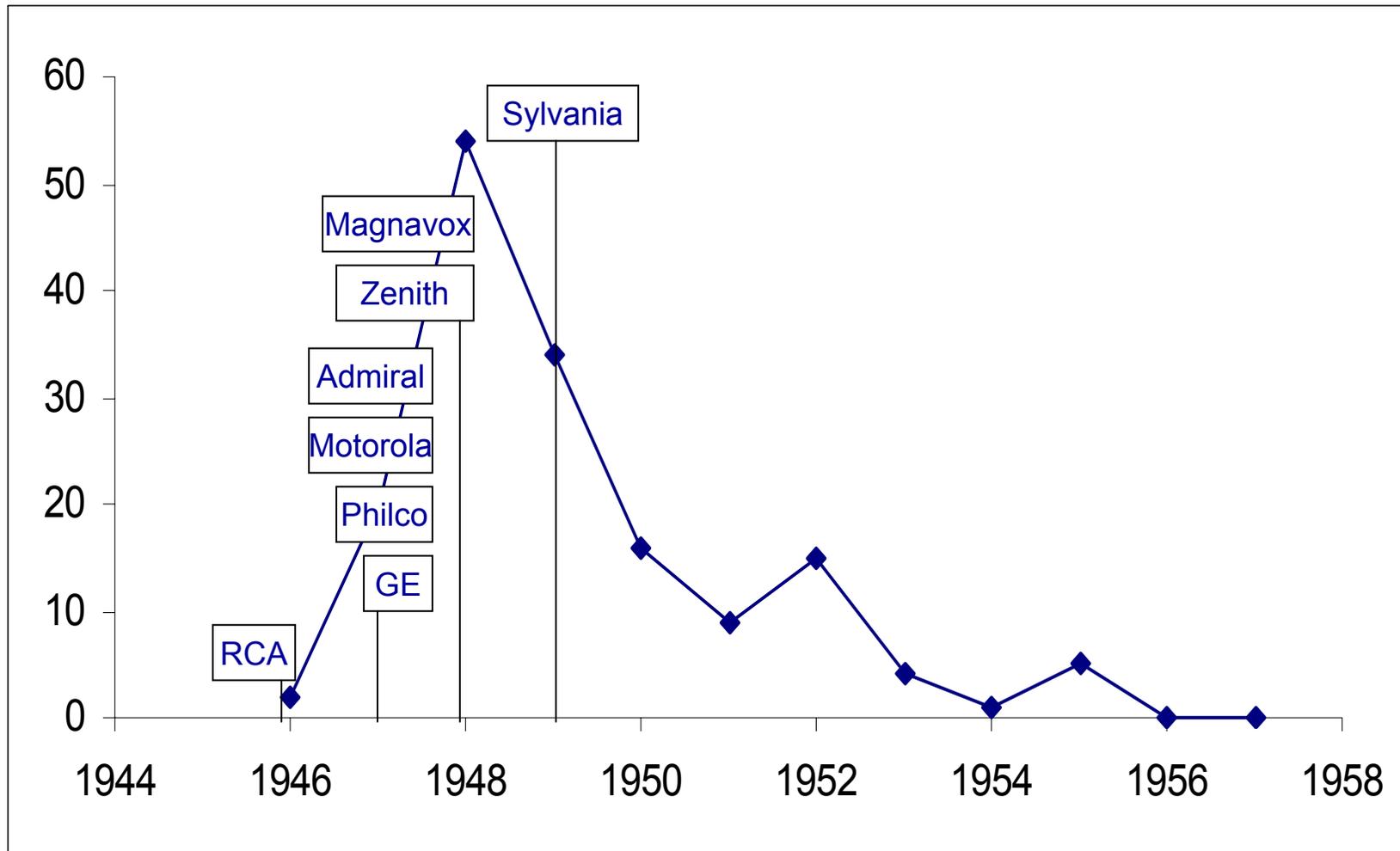


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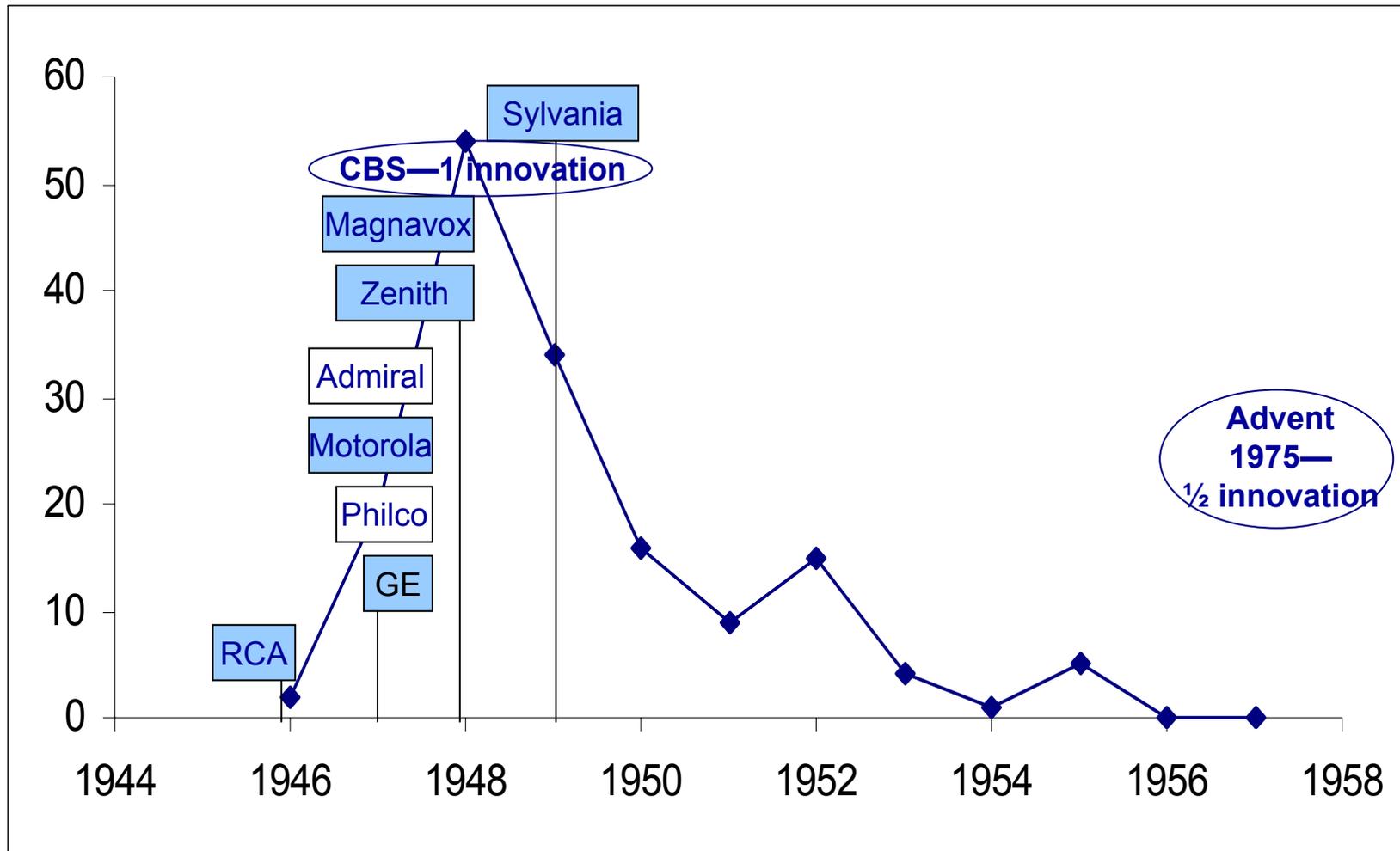


24 Major U.S. Innovations—1946-1979

Who Innovates?



24 Major U.S. Innovations—1946-1979



Theory of Early Mover Advantage

- **Grow first & become larger**
- **Size conditions incentives to innovate**
- **Self reinforcing process**
 - Bigger do more innovation
 - Better products, lower costs → grow bigger
- **Eventually no entrant can compete**
- **Then later entrants forced to exit**

Origin and Breeding of the Leaders

■ Early leaders tend to be diversifiers

- TVs—radio firms
- Penicillin—drug & chemical producers
- Tires—rubber producers
- Semiconductors—electronics firms

The Best of the Best—Radio Firms Entering TV Industry

- 265 radio producers at start of tv industry
 - Determinants of entry
 - Size—top radio producer (> \$1 million in assets)
 - Years of experience
 - Producer of home radio
 - Same factors conditioned longevity
-

Changing of the Guard: Autos & Semiconductors

Early Auto Leaders

Locomobile
Olds Motor Works/GM
Cadillac/GM
Jeffery/Nash

Later Top 10

Ford
Reo
Buick/GM
Maxwell-Briscoe/Chrysler
Willys
Studebaker
Brush
E.R. Thomas-Detroit/Chr.
Hupp
Hudson
Dodge/Chrysler
Chevrolet/GM
Durant Motors

Early Semiconductor Leaders

GE, RCA, Raytheon, Sylvania, West., Philco
Motorola
Texas Instruments
Fairchild

Later Top 10

Signetics
Analog Devices
AMI
National
Harris
Intel
AMD
Mostek
Micron Technology
VLSI Technology
LSI Logic

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AMI

National

Harris

Intel

AMD

Mostek

Micron Technology

VLSI Technology

LSI Logic

Spinoffs Reign!

Origin & Performance of Spinoffs

Firm fertility: Main Determinants

Top firm/market share	+
Detroit/Silicon Valley	+
Non-spinoff entry rate	+
Acquired by outside firm	+
Acquired by competitor	+
Age +	} Max at middle age
Age ² -	

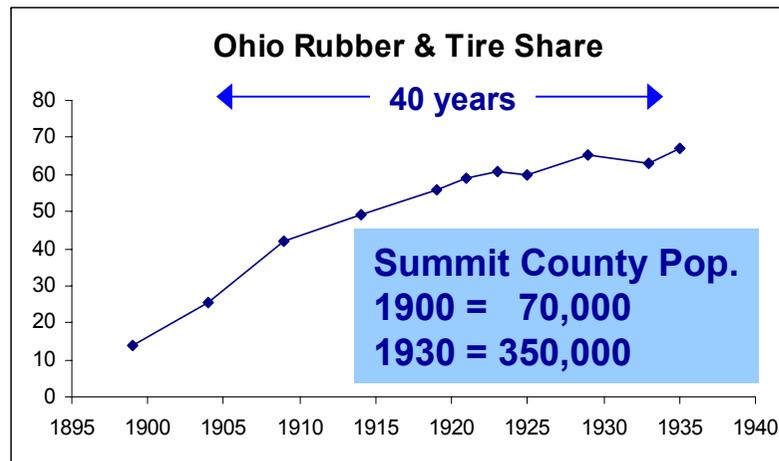
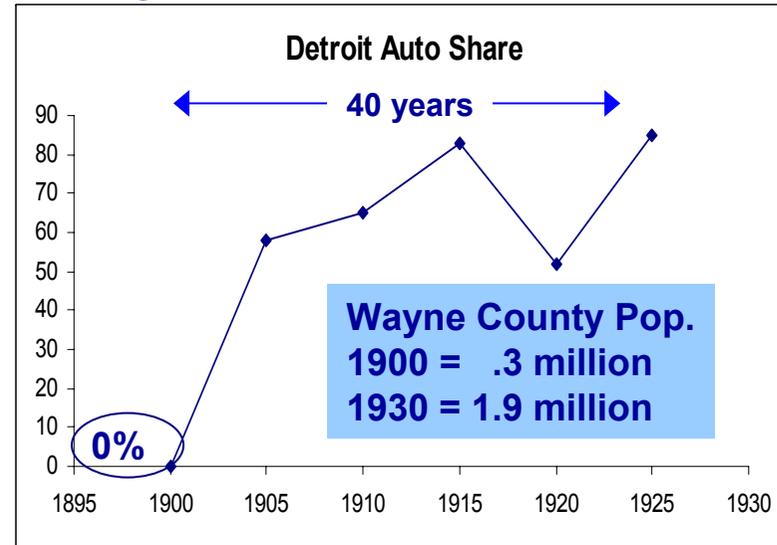
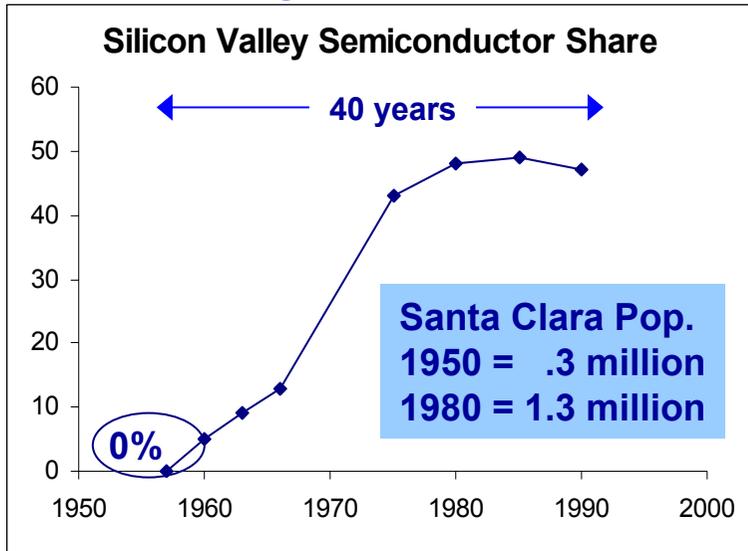
Performance of Spinoffs

- Superior to other startups
 - Better firms have better spinoffs
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Disagreement Theory of Spinoffs

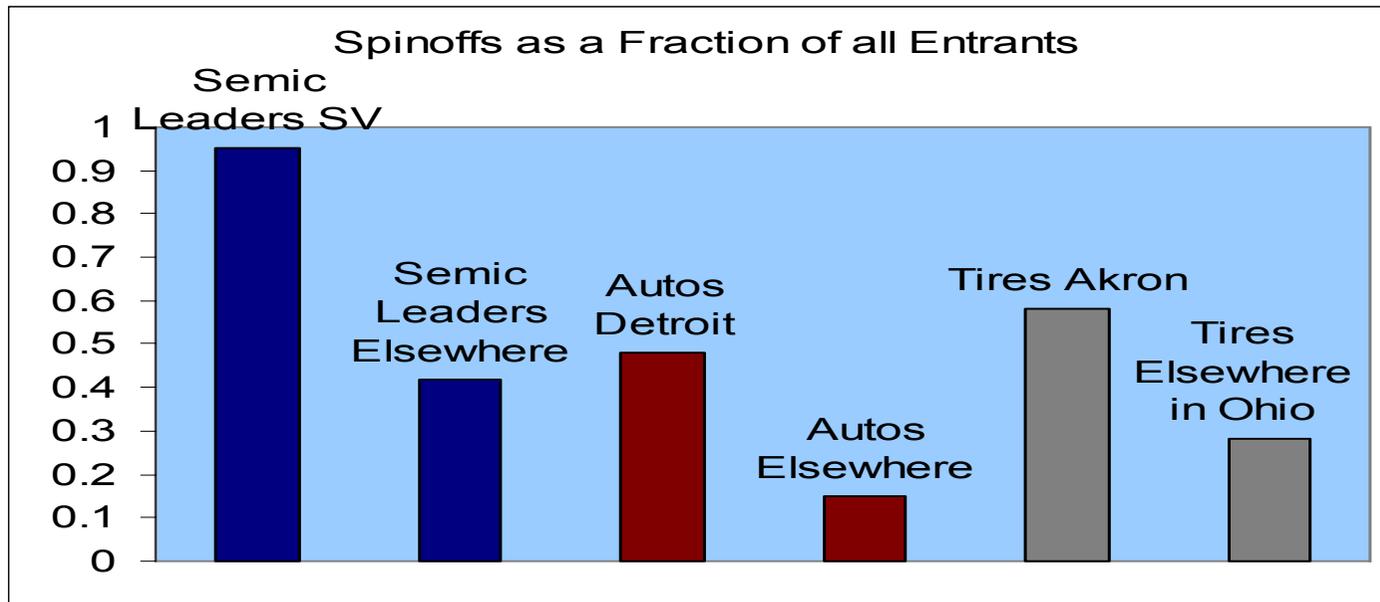
- **Spinoffs result from unrecognized good ideas**
 - Better firms--better employees w/better ideas
 - So better firms have more & better spinoffs
 - Spinoffs distinctive performers
- **Firms are formed of like-minded people**
 - No chance of spinoffs initially
 - Information accumulation eventually eliminates disagreements
 - So spinoffs more likely at middle age
- **Acquisitions ↓ influence of decision makers**
 - Larger disagreements after acquisitions
- **Spinoffs provide outlets for dissidents w/ good ideas**
 - Financed by better judges of ideas/talent

Dynamic Industry Clusters



Common Patterns

- **Great early firm**
 - Autos—Olds Motor Works in Detroit
 - Tires—Goodrich in Akron
 - Semiconductors—Fairchild in Silicon Valley
- **Spinoff driven growth**



Region Make the Firms or Firms Make the Region?

New Automobile Firms—"Initial" Capital

Initial Capital >	Detroit Spinoffs	Non-Detroit Spinoffs	Detroit Startups	Non-Detroit Startups
\$1 million	7.7%	1.1%	0.0%	1.3%
\$300K	17.3	4.4	5.4	3.6
\$50K	53.9	38.9	37.8	19.3

New Ohio Tire Firms—"Initial" Capital

Initial Capital >	Akron Spinoffs	Non- Akron Spinoffs	Akron Startups	Non- Akron Startups
\$1 million	7.1%	0.0%	7.1%	0.0%
\$300K	42.8	10.0	14.2	11.8
\$50K	71.3	46.6	49.9	39.3

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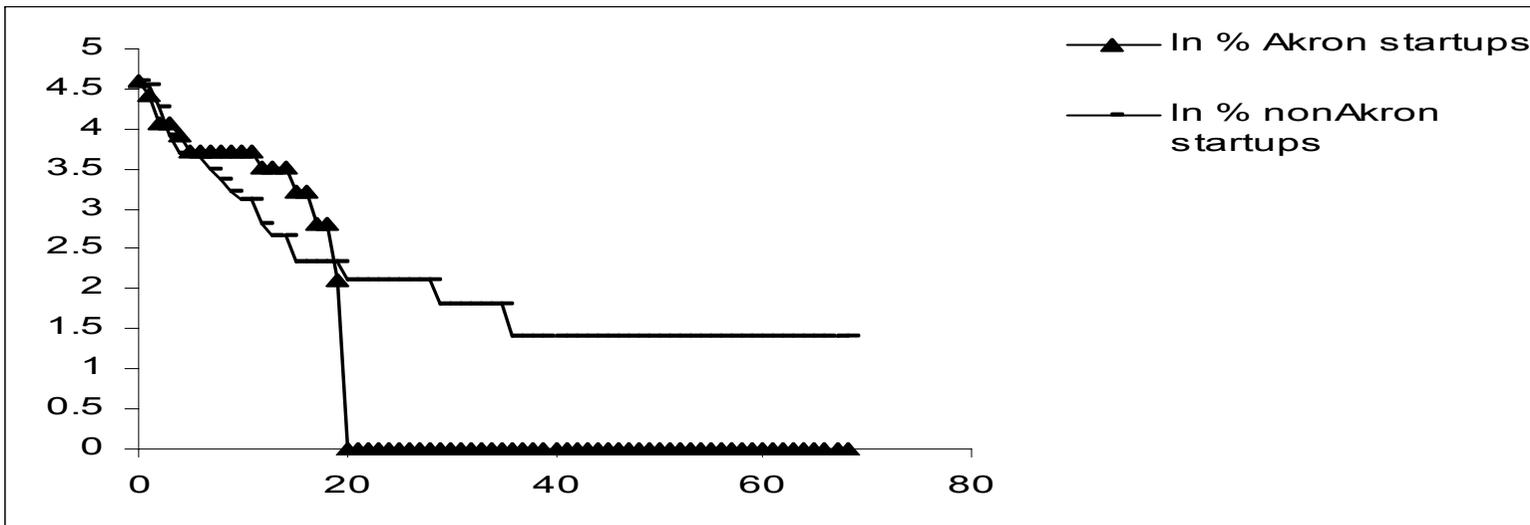
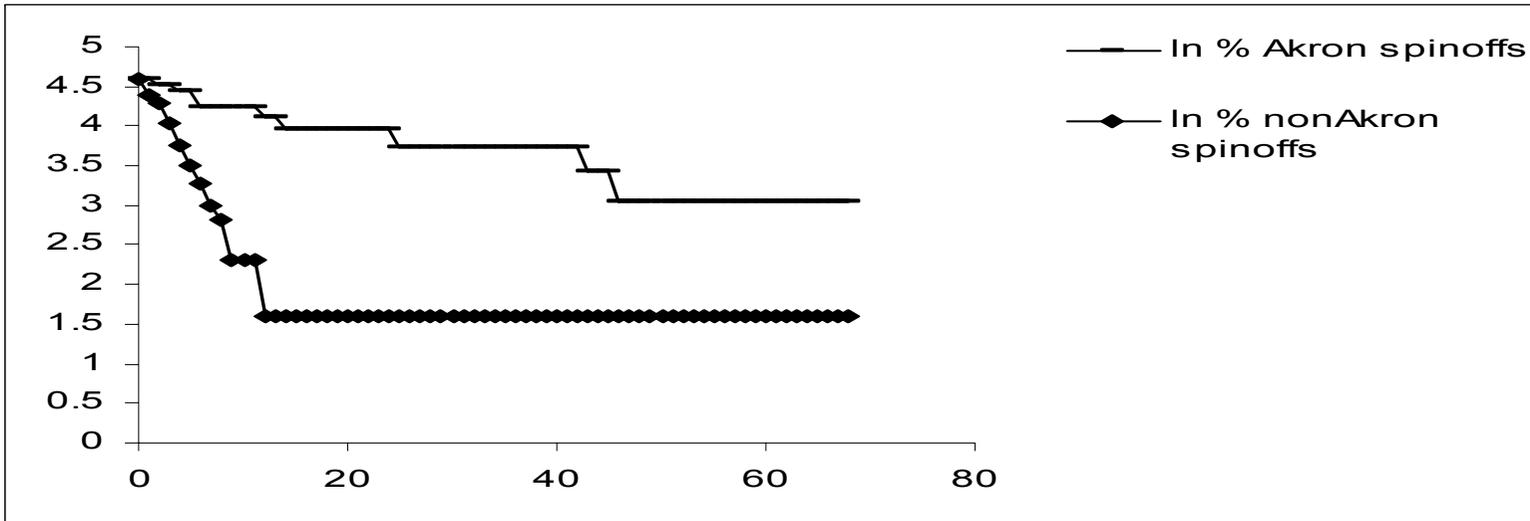
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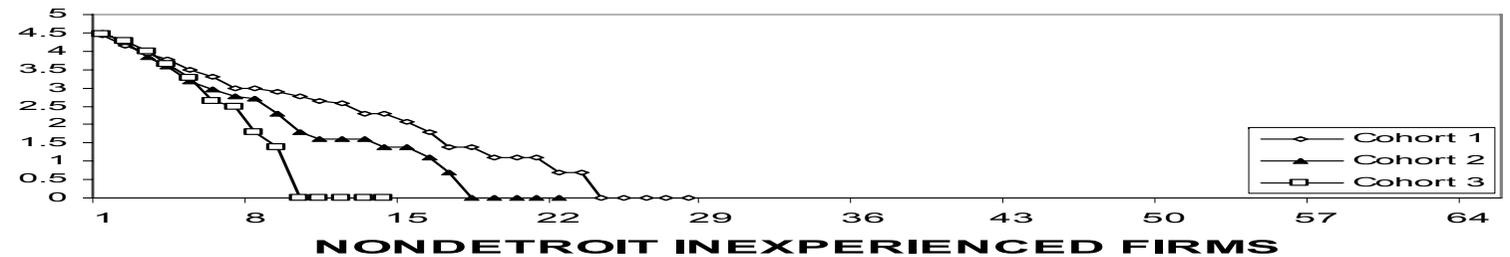
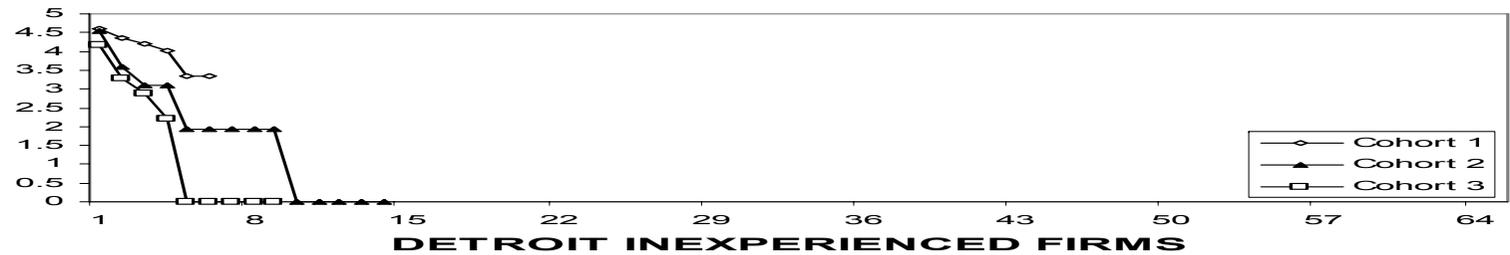
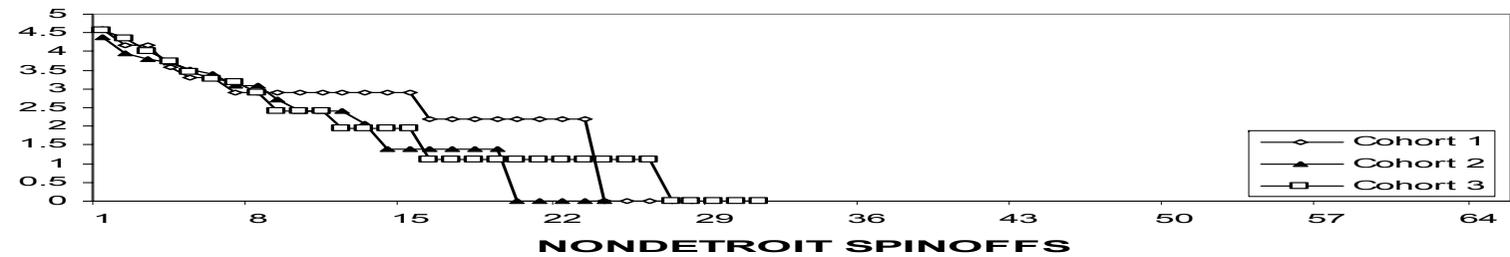
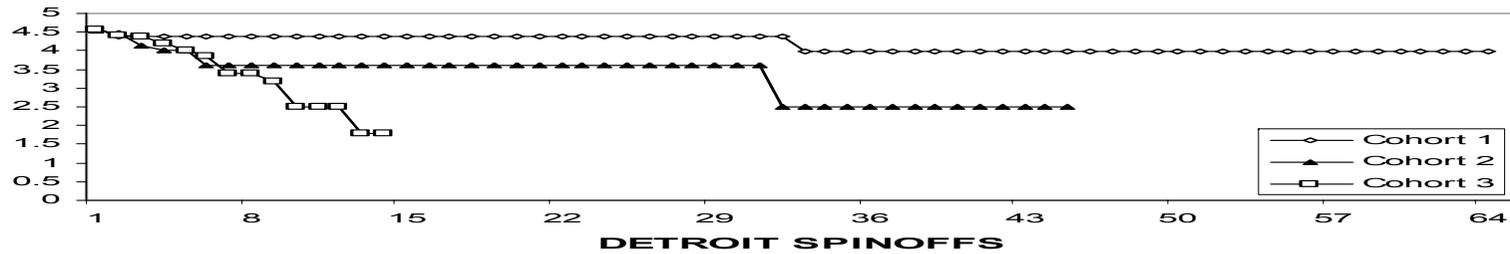
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Survival of Spinoffs & Startups in Akron & Elsewhere in Ohio



Survival of Spinoffs & Startups in Detroit & Elsewhere



Management Practices in Young Innovative Industries

■ **Early commitment to innovation**

- Exploit size advantage if arises
- Commit early to process as well as product innovation
 - Process most exploits the advantage of size
- Make your product a “dominant design”
 - Don’t wait for product innovation to slow down

■ **Greatest threat is from within**

- Internal division for dissident employee ideas
 - Corporate spinoffs
 - Recruit outsider investors & managers
-

Competition Policy for Young Innovative Industries

- **Resisting the inevitable may be wasteful**
 - Social as well as private advantage to size
 - Greater % socially beneficial innovations undertaken
- **What's good for incumbents may not be good for society**
 - Limited vision of incumbents
 - Decline of autos, tires, tvs in U.S. after entry foreclosed
 - Small number of gatekeepers, no outlets for dissidents
 - Spinoffs a key outlet for dissidents
 - Narrow interpretation of trade secrets

Broad Policy Implications

- **Mobility, mobility, mobility**
 - Employee non-compete covenants
 - Trade secret law
 - Free movement of employees
 - Promote founding teams
 - Limited responsibility of founders if fail
- **Clusters not worth promoting**
 - Except perhaps as stimulus to spinoffs
- **Planting seeds?**
 - Basic research support—universities & beyond
 - Universities as source of firms?

Implications for Theorizing About Competition in Innovative Industries

- **Entry exerts limited discipline**

- Unlimited queue of able potential entrants a myth
 - Heterogeneity in backgrounds, time of entry

- **Entry a vehicle for innovation**

- Modeling conditions bearing on entry
 - Entrants specialized—e.g., spinoffs
 - Availability of complementary producers important

