

# Using Micro Data to Understand Macro Dynamics

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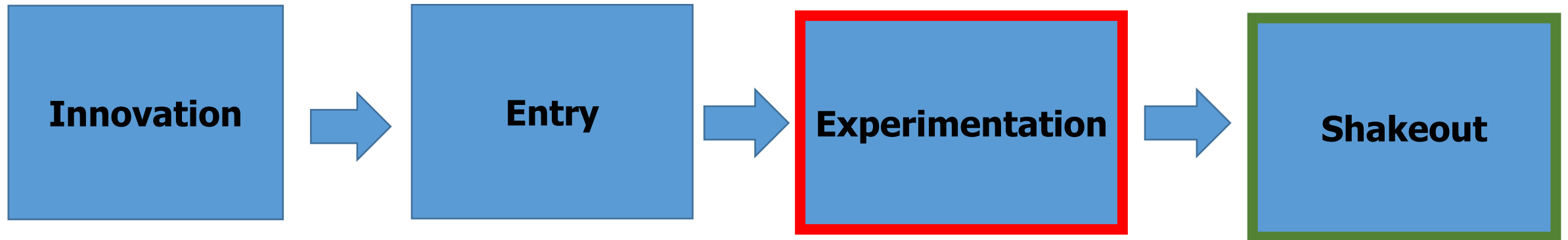
Bank of Canada Annual Economic Conference

*Micro data to macro implications and how central bank policies should reflect them*

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Any opinions and conclusions expressed herein are those of the author and do not represent the views of the U.S. Census Bureau. All figures use publicly available data and/or previously published results (CBDRB-(FY20-(259, 357), FY21-(058, 113, 261, 292, 305, 316), FY22-(057, 102)). Works cited and Census products used are listed on last slides.

# Productivity Dynamics



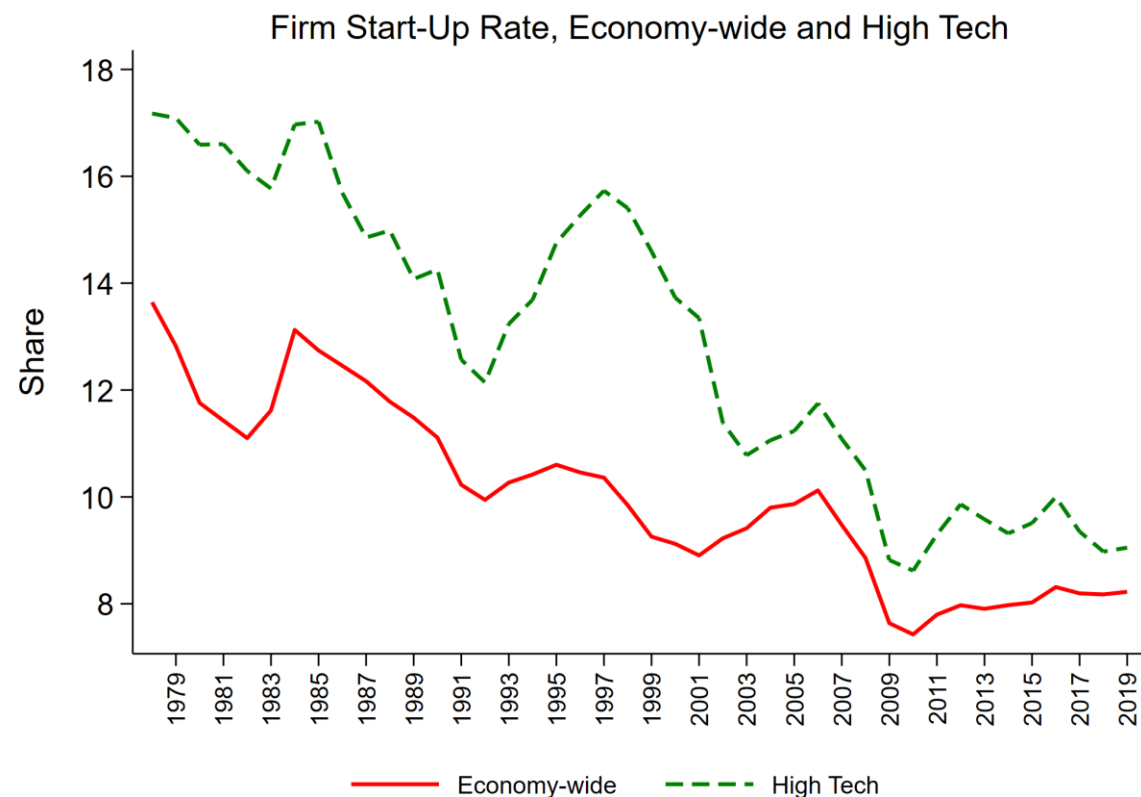
Framework: Inspired by Gort and Klepper (1982)

Empirical analyses: Regressions of productivity dispersion (productivity growth) on entry with high-tech dummy over three (3-year) periods. Industry aggregates using micro-level data from the Longitudinal Business Database.

Sources: Foster et al. (2021) and Cunningham et al. (2021)

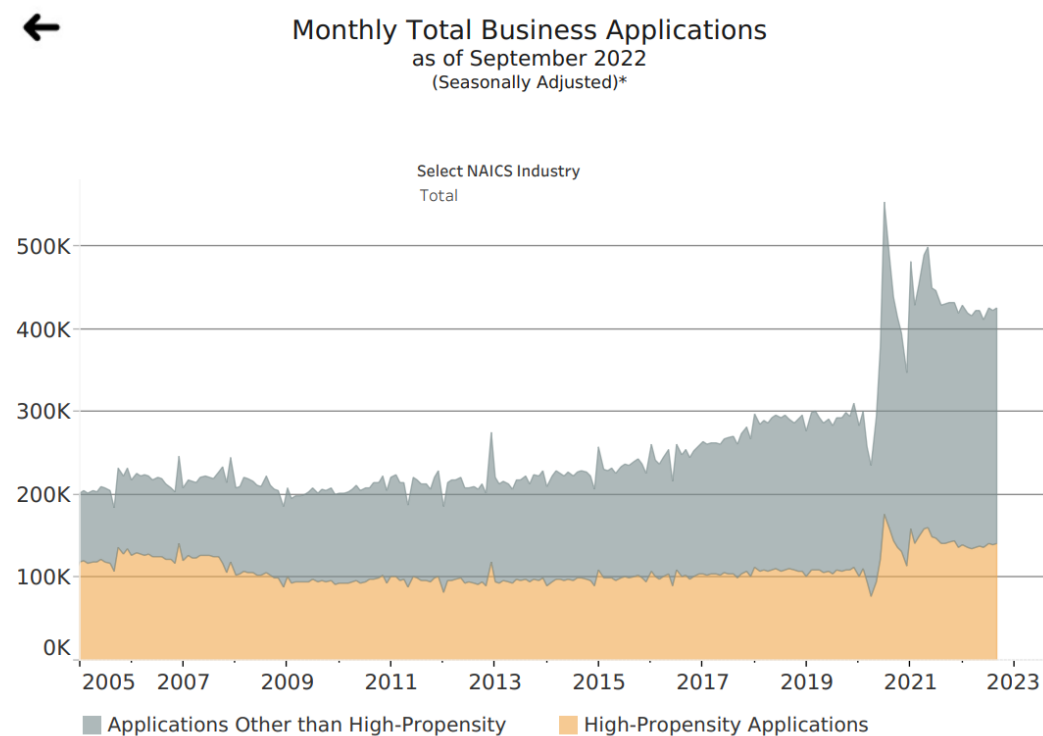
# Reallocation (part 1)

- **Business Dynamic Statistics**
- 6M employer firms per year
- Decker et al. (2016) find declining dynamism in terms of firm entry and exit; worker flows; job creation and destruction.
- Holds to lesser extent for High-Tech part of economy.
- Negative impact on productivity growth through entry channel and less efficient reallocation.



# Reallocation (part 2)

- **Business Formation Statistics**
- Applications for an Employer Identification Number
- Bayard et al. (2018) apply criteria to generate Business Application and High Propensity Business Applications (yellow).
- Pandemic: from 200K to 500K.



# Innovation (part 1)

- **Annual Business Survey 2019**
- 300,000 firms, non-ag sectors
- Acemoglu et al. (2022) find:
  - Adoption is low for AI and robotics
  - Concentrated in larger (and controlling for size, younger) firms
  - Industry important determinant
  - Use of these technologies is associated with 15% increase in productivity -- ~1/3 of gap between frontier firms and others (not causal)

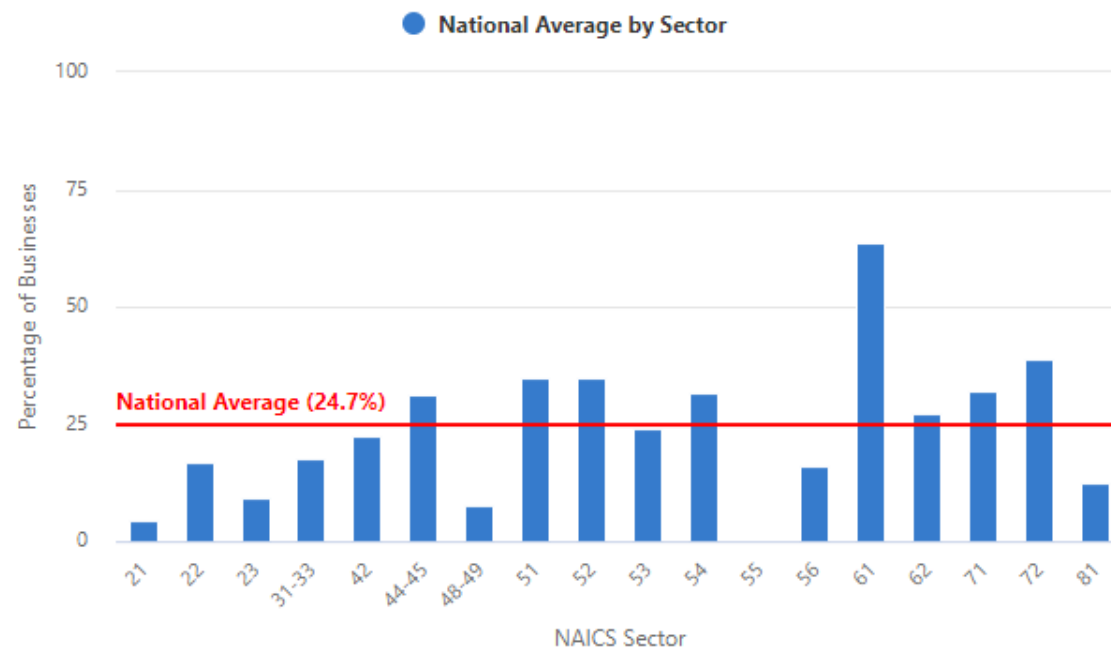
	AI Use	Robotics Use
Firms	3 %	2 %
Worker Exposure	13 %	16 %
Manufacture Worker Exposure	23 %	45 %

# Innovation (part 2)

- **Small Business Pulse Survey**
- Weekly email to ~100,000 small businesses with 25% response rate. Started April 2020.
- Summer 2020: Increased online platform use: 25% for national average; 64% in educational services.
- A more detailed view will be possible via ABS 2023.

Since March 13, 2020, has there been an increase in this business's use of online platforms to offer goods or services? ☰

Data Collected 08/09/2020 to 08/15/2020



# Summing Up

- **Productivity dynamics:** Framework inspired by Gort and Klepper helps us start to understand the connection between productivity growth, reallocation, and innovation.
- **Reallocation:** Pre-pandemic low entry rates suggest slower productivity growth to come; but pandemic surge in applications could suggest higher productivity growth to come. Not clear how many of these applications will result in employer businesses or moreover ones destined for growth.
- **Innovation:** Impact with a lag. Technology adoption concentrated by industry and in large or younger firms; but pandemic may have hastened adoption / intensity of use. Not clear how much adoption is above normal and permanent, future work will examine this.

# Additional Slides

Background information



# Other Ongoing / Future Work

- **Characteristics of AI adopters:** McEhleran et al. (2022) using 2018 ABS.
- **Automation and workers:** Acemoglu et al. (2022) using 2019 ABS.
- **Production technology:** Foster et al. (2021) using Annual Survey of Manufactures (ASM).
- **Labor adjusted for tasks/skills:** Cunningham et al. (2022) combining Occupational Employment and Wage Statistics and DiSP (and ASM).

# Data Products

- Annual Business Survey (joint with NCSES): [Annual Business Survey \(ABS\) Program \(census.gov\)](#)
- Business Dynamics Statistics: [Business Dynamics Statistics \(BDS\) \(census.gov\)](#)
- Business Formation Statistics: [Business Formation Statistics \(census.gov\)](#)
- Dispersion Statistics on Productivity (joint with BLS): [Dispersion Statistics on Productivity \(DiSP\) \(census.gov\)](#) and [Dispersion Statistics on Productivity \(DiSP\) \(bls.gov\)](#)
- Small Business Pulse Survey: [Small Business Pulse Survey \(census.gov\)](#)

# References

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