

**Reflections on
“The Contribution of High-Skilled
Immigrants to Innovation in the United
States”**

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General reaction

- Love the paper
- Important topic on which not complete consensus
 - Brings lit closer to consensus for US
- Impressive data collection and merging
- First testing of mechanisms
- Clever use of existing techniques in new setting
- Clever combination of theory and data for big picture

Logical flow (1)

- 1 Theoretical insight **Contribution 1**
 - Spillovers can be permanent
 - I.e. not just more productive now due to good collaborator
 - Gain permanent human capital usable later/elsewhere
 - → structural model to estimate immigrant contribution
- 2 Immigrants patent more than natives
 - Then focus on inventor samples
- 3 Quality of immigrant patents higher
 - New clever method: stock market effect

Logical flow (2)

- ④ Immigrants globalize knowledge **Contribution 2**
 - Immig work together initially, then increasingly with natives
 - Immig cite (and cited by) more patents abroad
 - Previous lit is on scientific publications

- ⑤ Immigrants have greater positive spillovers than natives **Contribution 3**
 - Inventor death impact; much better ID than existing lit
 - First to test mechanisms

Limitation (?) if issue is immigration policy

- Paper \neq causal overall effect of immigration on innovation
 - As title seems to imply
- Can't tell if immigrants crowding out native inventors, but:
 - Higher quality of immig patents
 - + rising collaboration with natives + positive spillovers
 - = v. unlikely enough crowdout to lower overall innovation
 - So current immig policy seems to promote innovation
- But needn't view as immig policy paper
 - How does size of spillovers compare with previous lit?

Thorny issue

Analysis using citations to proxy quality: citations normalized

- Patents in different techs have different citation rates
 - Different years have different citation rates
- This could reflect how innovative/influential the techs are
 - Or that difference meaningless c.f. biology vs economics
- Authors take latter view; normalize citations by tech-year
 - \Rightarrow citation analysis shows immig better than natives in same field (and year)

Mechanisms of spillovers – puzzle (1)

Logical flow leads us to expect that immigrants have more positive peer effects because have more and better patents.

- But this only explains 35% of gap!
- And after all controls, gap larger than before
- “Problem” is that immigrants have better collaborators
 - And better collaborators less affected by death

Mechanisms of spillovers – puzzle (2)

- So what is missing?
 - Not mismeasurement of patent quality: affects all inventors
 - May be omitting measures → underestimating immig quality
- ① May be missing pre-immigration non-US patents
- ② Perhaps immigrants play more important role in teams
 - They have higher education (NSCG)
- ③ Immig may doing more publishing →
bigger network with scientists/different type of inventor
- ④ May have died younger, but have more patents per year?
 - Not sure if controlled for
 - May have died earlier in career which starts at older age due to higher edu

Consensus immigration increases US innovation?

1 Increases

- This paper supportive
- Kerr and Lincoln (2010)
- Hunt and Gauthier-Loiselle (2010)
- + refugees from Nazis + Wigger (2020)

2 Does not increase

- Doran, Gelber, Isen (2014)
- +Borjas and Doran (2012) – mathematicians

Reconciliation of US papers

- 1 Doran, Gelber, Isen look at inflows of H-1Bs
 - Inflows large % medium-skill programmers, short stays
 - Stock of H-1Bs is much more skilled than inflows
- 2 Also, their sample of firms may be selected
 - Mahajan et al. (2024) similar to DGI except H-1B lotteries with more firms
 - Find no displacement of native workers, contrary to DGI
 - Do not examine patents - but likely also different results

Does high-skill immigration universally boost innovation?

- Perhaps boosts innovation
 - Only in very innovative countries (attract best)
 - Only where firms pick immigrants (choose best)
 - Or innovative countries = those where firms pick immig
- Canada
 - Smaller tech/bio sector, firms did not pick immigrants
 - Blit, Skutered, Zhang (2020) replicate Hunt and GL
 - No effect of skilled immigration on patenting
 - Ex-STEM immigrants not working in STEM

Switzerland

- 2023 most patents apps per cap at Euro Patent Office
 - 7th total; US first
- Firms pick immigrants
 - Share of immigrants in country double US share
- Cristelli and Lissoni (JEEA forthcoming)
 - Facilitating commuting to Switz increased Swiss patenting
 - Through collaboration with resident inventors

Non-Swiss Europe

- Papers mostly about diversity not immigration
- Overall picture unclear to me

Summing up

- Skilled immigration raises innovation in US
 - Via skilled immigrants who stay longer
 - Diamond paper provides valuable supporting evidence especially regarding collaboration/spillovers
- Not a universal effect
 - May only operate in innovative countries where firms pick immigrants
 - Which may be a virtuous circle